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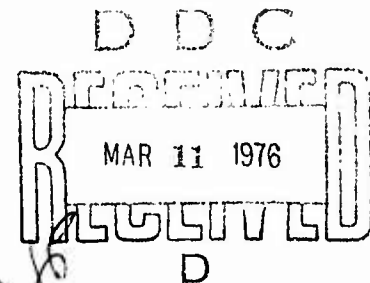
CH-54 OPERATIONAL STATISTICS

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Prepared for

EUSTIS DIRECTORATE

U. S. ARMY AIR MOBILITY RESEARCH AND DEVELOPMENT LABORATORY

Fort Eustis, Va. 23604

EUSTIS DIRECTORATE POSITION STATEMENT

The CH-54 helicopter has been validated in the Army Reliability and Maintainability (R&M) Model. A factorial analysis was used to design a set of simulation experiments to determine model sensitivity, credibility, and sufficiency. Changes in operational availability resulting from changes in TBO policy, major inspection policies, failure rates, Not Operationally Ready Supply (NORS) rates, and utilization rates were consistent with actual data from the field.

The conclusions contained herein are concurred in by this Directorate.

The technical monitors for this contract were Mr. Howard M. Bratt, Mr. Robert L. Walker, and Mr. Gary R. Newport, Military Operations Technology Division, Eustis Directorate.

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

The purpose of the CH-54 Operational Statistics program was to validate the CH-54 helicopter in the Army's tactical aircraft reliability and maintainability model and to analyze the results obtained from the factorially designed arrangement of simulation runs on sensitivity, credibility, and sufficiency. Changes in utilization, failure rate, NORS waiting time,

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TBO concepts, major inspection durations, and repair/replacement time distributions were studied. Effects on operational availability, intrinsic availability, unscheduled elapsed maintenance downtime (including and excluding NORS time), and mission accomplishment were evaluated.

A baseline model was established by making successive simulation iterations and refinements until all output statistics tested fell within the allowable statistical range of the expected CH-54B R&M characteristics and operational conditions.

Among the major findings of this program were:

a) Simulation error was very large, but could be reduced substantially by employing a factorial arrangement of simulation runs.
b) Simulation error could be further reduced if the model's logic were changed in the method of simulating failures.
c) Despite the large simulation error, sensitivities were able to be established for most parameters studied. Low utilization for the number of aircraft simulated was probably the primary cause for little or no change in mission accomplishment.
d) Types of repair/replacement distribution assumed do not alter the simulation results, provided the mean time to repair/replace value is correct.
e) Short-term scheduled maintenance requirements of 30 hours between major inspections as opposed to longer term "periodic" scheduled maintenance of 100 hours show indications of compromising operational availability and maintenance man-hour resources.

The study results were substantiated on a rigorous statistical basis.

SUMMARY

The CH-54 Operational Statistics program was performed under Contract DAAJ02-74-C-0064 for the purpose of validating the CH-54 helicopter in the Army's tactical aircraft Reliability and Maintainability (R&M) model and to analyze the results obtained from the factorically designed arrangement of R&M simulation runs on sensitivity, credibility, sufficiency and application regimes.

The NORS and cannibalization subroutine was employed using CH-54B field data gathered through the ORME[1] program and the subroutine was exercised throughout the study effort. The studies showed that employment of the NORS and cannibalization subroutine used in conjunction with an 8 hour a day, 5 days a week peacetime utilization introduces very large variation into the model. As a consequence, simulations covering a company unit operating period of 18 months were required to minimize this variability.

The CH-54 program provides a new dimension into the study of simulation results in that it provides a statistical methodology for the acceptance or rejection of simulation results as sufficiently representative of known field flight operations and for the determination of significant simulation results.

A baseline model was established by making successive simulation iterations and model refinements until all output statistics tested fell within allowable statistics limits of the expected R&M characteristics and operational conditions of the CH-54B. Having established the baseline, changes in utilization, failure rate, NORS waiting time, TBO concepts, major inspection durations and repair/replacement time distributions were studied.

Significant results found during this study were:

1) The simulation error associated with the operational availability model output is very large and hampers the ability of the model to measure the effects of major changes in Reliability and Maintainability aircraft characteristics.

2) Despite the large simulation error, the model generally provides the expected results, for example, increasing either utilization, failure rate or NORS waiting time by 20% produced about the same

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Note (1): The ORME program which was completed in mid 1974 was a U. S. Army-Sikorsky Operational Reliability/Maintainability Program established to collect and evaluate CH-54 R/M field data by trained R/M engineering personnel. Its purpose was to construct accurate and timely data profiles of failure and maintenance problems observed under monitored operational conditions and establish failure trends in order to intensify R/M improvement in current and future helicopter designs.

net effect, i.e., that of decreasing operational availability by 5%. A notable exception of this was found in attempting to measure the effect on mission accomplishment where the simulation error totally masked any cause/effect relationship induced by increasing NORS, failure rate, and utilization. Low utilization for the number of aircraft simulated appeared to play a most significant part in causing little or no change in mission accomplishment.

3) The ability to measure changes in operational response was enhanced by the use of the factorial analysis procedures in the study. The use of the factorial approach in this study not only minimized the influence of simulation error which threatened to cloud the determination of real changes in model output, but also substantially reduced the number of simulation runs required to perform the analysis. In many cases this reduction in runs was by a factor of 3 to 1.

The simulation error of this model is large and the number of iterative simulation runs required to establish the validity of the model and to perform sensitivity studies was excessive despite the mollifying influence of the factorial approach. A method is recommended for minimizing the simulation error of the R/M model which will have the combined effect of reducing the number of iterative runs required and improving the sensitivity of the model. This recommendation involves a change in the method of simulating failures according to "when discovered" events.

PREFACE

The work for this study was authorized by Contract DAAJ02-74-C-0064 by the Eustis Directorate, U. S. Army Air Mobility Research and Development Laboratory, Fort Eustis, Virginia, under the technical cognizance of Mr. Howard Bratt, Mr. Gary Newport and Mr. Robert Walker.

The Sikorsky Aircraft personnel involved in performing and contributing to this study were:

    Mr. A. A. Wolf, Supervisor of Reliability and Maintainability

    Mr. R. W. Caseria, Reliability Engineer and Program Manager

    Mr. J. V. Stern, Computer Programmer

    Mr. N. T. Spencer, CH-54 Field Reliability Engineer

    Mr. C. D. Holbert, Maintainability Engineer

    Mr. J. K. Bosse, Computer Programmer

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INTRODUCTION

This program was undertaken to validate the Army R&M model for use in simulating CH-54B operation. A secondary but equally important purpose was to incorporate some statistical rigor into the measurement and interpretation of the simulation results.

The information collected and analyzed during this program is presented in the following seven sections:

(1) CH-54B Aircraft Description

(2) CH-54B Aircraft Operation

(3) R&M Model Data Input for CH-54B

(4) R&M Model Program Updates to Accommodate the CH-54B Aircraft/ Operation

(5) Validation of the CH-54B Version of the R&M Model

(6) Statistical Analysis of Simulation Results

(7) Conclusions and Recommendations

The CH-54B field experience used in constructing the CH-54B version of the R&M model was primarily taken from the Operations Reliability/Maintainability Engineering (ORME) program. This was an Army/Sikorsky data collection and product improvement program which included 3 years of CH-54B operation by 25 aircraft. The ORME program provided the expected values used in the CH-54B/R&M model validation.

The sensitivity studies were based on varying certain aircraft and operational factors in a factorial design arrangement to improve the statistical interpretation of the simulation results. The methods of varying these factors were optional in some cases. In the case of utilization, this chang. was produced by varying the number of mission launches per day as opposed to varying the number of aircraft required for a mission or the mission duration. The NORS factor was varied by changing the delay time to acquire a spare rather than changing the probability that a spare part was needed but not available.

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DISCUSSION

The CH-54B model is a modification of the UH-1N R&M simulation model which was supplied to Sikorsky Aircraft by the Eustis Directorate. The first part of this discussion describes the CH-54B aircraft characteristics and CH-54B operational environment that are being simulated. As part of the aircraft description, Appendix I is provided to identify the elements of the CH-54B and their failure rates. Following this information is a discussion describing the specific input and model logic changes incorporated into the original UH-1N R&M model to construct the CH-54B model. Appendixes II, III, and IV further identify these modifications. The last part of this discussion describes the CH-54B model validation effort and a statistical analysis of the simulation results of running the model under a variety of alternative operating conditions and maintenance concepts, and the conclusions and results derived therefrom. Appendix V provides additional detail on the factorially designed statistical analysis performed in this program. Figure 1 illustrates the input, constraints and output that are essential to the CH-54B model described herein.

CH-54B AIRCRAFT DESCRIPTION

The CH-54B is a crane-type, 40,000-lb category helicopter. It has been used extensively in Southeast Asia to move heavy Army equipment and to retrieve downed aircraft. The operation simulated in this program, however, is peacetime, state-side operation.

For the purposes of the R&M model input function structure for failure, repair, and replace information, the CH-54B has been identified according to the following subsystem/component breakdown, which has been described as consisting of 20 subsystems comprising a total of 296 components. The categories of main and tail rotor blades, engines and fuel controls are represented by more than one component element to permit tracking each blade, etc., individually for monitoring their scheduled TBO removal times. The system codes to be used in describing the 20 subsystems and their components are consistent with those used in the Operational Reliability/ Maintainability Engineering (ORME) program and are identified below.

Subsystem	Subsystem Code	Components Elements
Airframe	01	01-20
Landing Gear	02	01-24
Mechanical Flight Controls	03	01-13
Rotors/Blades	04	01-32
APP Installation	05	01-08
Transmission	06	01-23
Power Plant Installation	07	01-22
Heater/Anti-Ice	08	01-05
Electrical	09	01-16
Hydraulic Flight Controls	10	01-11
Hydraulics	11	01-13
Fuel System	12	01-05
Utilities	13	01-08

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OUTPUT

Operational Availability

Intrinsic Availability

Mission Accomplishments

Direct Maintenance Man-Hours

Elapsed Maintenance Down Hr with & without NORS

Mission Reliability

Scheduled Maintenance Man-Hours

Unscheduled Maintenance Man-Hours

TBO Maintenance Actions

Scheduled Maintenance Actions by Type

Failure Frequencies by When Discovered

Maintenance Manpower Utilization by Maintenance Specialty

NORS Contribution to Down Hours

CONSTRAINTS

Large Simulation Variation
Necessity for Iterative Solutions
Need for Stability Check with Major Logic or Input Changes
Extensive Interlaced Aircraft/Subsystem/Component Failure, Repair & Replacement Definition

INPUT

Mission Profile
Types & Duration
Launch Schedule
No. of A/C Req.

A/C Reliability Profile
A/C Failure Frequency
When Discovered Failure Distribution
Subsystem & Component Contribution to A/C Failure
Mission Abort Frequencies

A/C Maintenance Profile
Repair & Replacement Times
Maintenance Specialty Req.
Preflight, Daily & Major A/C Insp. Intervals
Scheduled TBO Req.
Test Hop Requirements

Maintenance Support Environment
Maintenance Manpower Force
Logistics Environment
Cannibalization Philosophy

Daily Operational Plan
Permissible Flight Day
Scheduled Maintenance Shifts
Daily & Major Insp. Checks & Schedules

Figure 1. CH-54B Model Input/Output Description.

Subsystem	Subsystem Code	Components Elements
Cargo Handling	14	01-11
Instruments	15	01-26
AFCS	16	01-15
Communications	17	01-14
Navigation	18	01-07
Turboshaft Engine	19	01-15
APP	20	01-08

The individual component identifications and the failure rates observed in the field relative to the components identified are contained in Appendix I. This information was taken from the ORME program and is representative of the 3-year history reported in SER-64344, Revision K.[1] The time change components, as identified in the CH-54B Organizational Maintenance Manual, TM 55-1520-217-20-2, are shown below with their high time removal limits.

Components	Number of Items	TBO (Hr)
Main Rotor Head	1	800
Tail Rotor Head	1	800
Main Rotor Blade	6	2500
Tail Rotor Blade	4	1600
Main Gearbox	1	625
Intermediate Gearbox	1	1200
Tail Gearbox	1	1200
AFCS Servo Assembly	1	1200
Fuel Control	2	800
Engine	2	800
Cargo Hoist	1	240[2]

CH-54B AIRCRAFT OPERATION

The CH-54B baseline operation is comprised of the following information.

- CH-54B Company Unit = 9 aircraft
- Operational Week = 5 Days
- Operational Day = 8:30 a.m. to 4:30 p.m.
- Number of Standby Aircraft = 1 (of the 9) aircraft
- Number of Holidays and General Inspection Nonflying Days = 18 Days per year
- Flight Hours for a 9-A/C Company Unit for 18 Months (28 Days/Month)= 2394 Hr, 1596 FH/Year, 14.8 FH/AC/Month
- Operational Availability = 54.5%

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(1) Geffert, G., and Holbert, C., Operations Reliability/Maintainability Engineering Program Quarterly Evaluation Report, Sikorsky Aircraft, SER-64344, Rev. K, May 15, 1974.

(2) Since the cargo hoist is used for no more than 10% of the missions, the simulation model input actually reflects 240/.1 = 2400 hours.

The company unit maintenance force used in the baseline operation is as follows:

Maintenance Specialist	MOS	No. Per Company Unit
a) A/C Maintenance Tech.	671C0	2
b) Helicopter Repairman	67x20	37
c) Electrician	67F20	2
d) Avionics Mechanic	35K20	3
e) Airframe Repairman	68G20	1
f) Engine Repairman	68B20	2
g) Tech. Inspector	67x30	2
h) Hydraulic Repairman	68H20	2
i) Power Train Repairman	68D20	1
j) Flight Engineer	67x2F	9

To provide a realistic distribution of failures for the various operational events for the baseline, information was taken from the CH-54 ORME program. Specifically the information was taken from the ORME Discrepancy/Corrective Action Reports. "When discovered" data and, in the case of in-flight aborts, the effect on mission data from these reports were used. The relationship between the data as collected through the ORME "when discovered" codes and the R&M model's operational events is shown below. In the cases of special inspections, acceptance inspections, transfer inspections and "on ground - not covered by above" actions, some engineering judgement was required to appropriately enter this data into the model. These judgements are indicated below and were made based on discussions with Sikorsky ORME reliability engineers and with the manager of the ORME program.

Relationship of ORME Data to R&M Model Requirements

ORME	R&M MODEL
Exterior & Interior Checks ⟶	1. Preflight
APP Start to Takeoff ⎫	2. In-Flight
In-Flight ⎬ ⟶	3. In-Flight Aborts (as further determined by "effects on mission" code)
On Ground to Eng. Shutdown ⎭	
Daily Inspection ⟶	4. Daily Inspection
Intermediate Inspection ⟶	5. Intermediate Inspection
Periodic Inspection ⟶	6. Periodic Inspection
Special Inspection ⟶	Prorated over 1, 4, 5, and 6 above
Acceptance Inspection[3] ⟶	Not Included
Transfer Inspection[3] ⟶	Not Included
On Ground - not covered by above ⟶	Prorated over 1, 4, 5, and 6 above

Table I shows the number of observed M.A.'s in the 9172 CH-54B flight hours (including those M.A.'s prorated) and the resulting system by system cumulative probability distribution for each aircraft operational event.

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(3) M.A.'s discovered during acceptance and transfer inspections together accounted for only .6% of the total M.A.'s and were not included since they occurred before, or were found after, the normal operation/maintenance cycle of the CH-54.

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TABLE I.   SYSTEM/EVENT MAINTENANCE ACTION DISTRIBUTION

Event System	Preflight MA's	Cum. Prob.	In-Flight MA's	Cum. Prob.	In-Flt. Abort MA's	Cum. Prob.	Daily MA's	Cum. Prob.	Intermediate Insp. MA's	Cum. Prob.	Periodic Insp. MA's	Cum. Prob.
01	23.2	.0824	13	.0087	2	.0210	50.2	.0453	13.1	.0645	120.5	.1201
02	16	.1392	33	.0307	1	.0270	63.7	.1027	20.2	.1640	115.3	.2350
03	15.3	.1936	18	.0427	-	-	18.6	.1195	23.8	.2812	20	.2549
04	46.1	.3574	50	.0761	13	.1053	151	.2256	32.5	.4413	181.4	.4356
05	4.3	.3727	20	.0895	7	.1475	25.9	.2790	-	-	35.8	.4713
06	36	.5006	123	.1716	23	.2861	155.2	.4189	20.8	.5438	107	.5779
07	12	.5432	119	.2510	20	.4066	146.3	.5508	10.3	.5945	70.5	.6481
08	8.2	.5723	36	.2750	-	-	7.3	.5574	.5	.5970	4	.6521
09	31.2	.6823	87	.3330	-	-	89.6	.6382	11.1	.6517	33.3	.6853
10	1.2	.6866	37	.3577	-	-	8.3	.6457	.2	.6527	13.3	.6986
11	24.8	.7747	87	.4157	25	.5572	94.4	.7308	3.9	.6719	37.9	.7364
12	5.4	.7939	42	.4437	5	.5873	2.9	.7334	10.8	.7251	23.9	.7602
13	4	.8081	33	.4657	7	.6295	13	.7451	.4	.7271	10.6	.7708
14	12.3	.8518	27	.4837	6	.6656	36.5	.7780	2.7	.7401	11.5	.7823
15	17.2	.9129	237	.6419	13	.7439	37.6	.8119	10.5	.7921	76.7	.8557
16	9.4	.9463	208	.7808	11	.8102	11.5	.8223	2.8	.8059	26.3	.8849
17	3.4	.9584	140	.8743	1	.8162	16.1	.8368	1.9	.8153	12.6	.8975
18	.5	.9602	62	.9157	-	-	5.7	.8419	.5	.8178	2.3	.8998
19	5.9	.9812	86	.9731	23	.9548	145.6	.9732	31.9	.9749	85.6	.9851
20	5.1	.9999	40	.9999	9	.9999	29.7	.9999	5.1	.9999	15.1	.9999
Total	281.5		1496.0		166.0		1109.1		203.0		1003.6	

Above data covers CH-54B operation from 1 April 1971 to 31 March 1974 and is based on 9172 aircraft flight hours.

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CH-54B/R&M MODEL CHARACTERISTICS

The CH-54B R&M model incorporates an 8 hour a day, 5 day a week, 28 day a month operation. The company unit strength of 9 aircraft has a flight operational requirement of approximately 14.8 flight hours per aircraft per month. Preflight, daily, intermediate, and periodic inspections are required. The average mission duration is 1.9 hours with .7 hours required for test hops. The model is detailed to reflect the failure rates, maintenance manhours to repair and to replace, and the elapsed maintenance times on approximately 300 components. Abort data, probability of the aircraft being not operationally ready, and requirements for test hops are also defined for these components. This information is covered in detail in the two previous sections and in Appendix II.

VALIDATION OF THE CH-54B

The validation of the CH-54B simulation model consists of three essential steps: the establishment of the CH-54B baseline model expected values as determined from ORME data, the evaluation of the simulation error associated with the CH-54B/R&M model, and finally the verification that the model has been revised and refined to agree with the expected values within the allowable tolerance permitted by the simulation error.

Table II contains the expected values for the baseline simulation. These are key field experience statistics collected through the CH-54B ORME program which provide the basis for validating the CH-54B simulation model output values as representative of CH-54B field experience. The information reflected in the table was accumulated over a 36-month period that extended from 1 April 1971 to 31 March 1974. The operational sites monitored were Ft. Eustis, Ft. Sill, Ft. Rucker, and Ft. Wainwright.

The CH-54B ORME program report SER-64344, Revision K, reflected a history of 422,592 total aircraft hours, of which 9171.6 were flight hours. Of the 422,592 hours, 5544 were discounted because they were associated with a downed Alaskan aircraft in which parts were not ordered for its re-activation. Total accountable aircraft hours were, therefore, 422,592 - 5544, or 417,048.

Because of the low CH-54B utilization, i.e., 9171.6 flight hours in 417,048 total hours, or 2.20% utilization, and because of the added simulation variation resulting from the incorporation of not operationally ready due to supply (NORS) and cannibalization data into the CH-54B simulation model, runs simulating 18-month company unit operation were needed to provide sufficiently accurate simulation output statistics for meaningful analysis. The need for the 18-month simulation runs is discussed further in the next section. As a result of the 18-month simulation duration, however, 9 aircraft x 24 hours per day x 28 days per month x 18-months, or 108,864 accountable aircraft hours, were reflected in the simulation runs. This resulted in a 9171.6 flight hour x (108,864/417,048) or a 2394.1 flight hour requirement for the 18-month baseline CH-54B simulation.

Total failure rates and abort rates shown in Table II have been taken from the SER-64344, Revision K, and the failure rate distribution has been derived from the study of the ORME Discrepancy Action Reports. The failure rates include both primary and secondary failures. They specifically exclude corrective maintenance actions found to be needed during acceptance and transfer inspections which account for .6 percent of the total corrective actions observed in CH-54B operation. Cannibalization M.A.'s which are incorporated into the model by way of probability of cannibalization indices and scheduled component replacement actions which are taken care of through the scheduled TBO subroutine are also excluded from these rates. Therefore, the model failure rate descriptions together with the M.A.'s accounted for by the cannibalization and scheduled TBO subroutines approximate 99.4 percent of the total observed CH-54B M.A.'s. The failure rates shown in Table II translate into the following expected number of failures for the various CH-54B operational events, based on the expected 2394 flight hours.

CH-54B Event	Fail. Rate x Flt. Time = Expected Failures
Preflight	.03069F/Hr x 2394 Flt. Hr = 73 Failures
Inflight	.16333F/Hr x 2394 Flt. Hr = 391 Failures
Inflight Abort	.01810F/Hr x 2394 Flt. Hr = 43 Failures
PMI	.02213F/Hr x 2394 Flt. Hr = 53 Failures
Daily	.12093F/Hr x 2394 Flt. Hr = 290 Failures
PMP	.10942F/Hr x 2394 Flt. Hr = 262 Failures

To determine what simulation duration was appropriate for estimating simulation error and for the factorial analysis study, the stability of the output statistics was analyzed over an 18-month period.

Figure 2 shows the convergence of important statistics exhibited by the CH-54B version of the R&M model over the simulation duration. To provide these statistics, two simulation runs were made under identical conditions, except for different random number sequences, and statistics were collected after each 2-month interval for the duration of the 18-month simulation. To highlight the variation of output values as the simulation progressed, the statistical value accumulated to the end of a period was compared with the value reflected at the end of the previous interval, and the percentage of differences was computed and plotted. The values were plotted through the 18th month. The plots were examined first to see whether any systematic error was evident. If the trend lines for the simulation runs reflected values that were consistently plus or consistently minus, then it would be reasonable to conclude that the model has not stabilized and was still seeking its normal long term, average operational condition. Review of this figure shows no evidence of systematic error. Second, the plots were examined to evaluate whether the improved stability of the 18-month statistics was sufficient to warrant the longer simulation running time. The plots showed no profound change in the stability of the statistics after the 10th month. The low CH-54B utilization, however, was known to cause high simulation error which could cloud the true operational characteristics. To obtain a better appreciation of this simulation error, statistical outputs from the two different runs were compared with particular attention paid to

TABLE II. ORME VERIFICATION STATISTICS

CH-54B Operational Data (April '71 to March '74)	Date Source & Value SER-64344 Rev. K	ORME Discrep/ Corr. Act. Rpts.
Total Aircraft Hours (Include 24 Hr a Day, 7 Days a Week Accountability)	417,048 Hr	
Total Active Hours	91,842 Hr	
Total Flight Hours	9,171.6 Hr	
Flight Hours per A/C per Month	14.78 Hr	
Total Failure Rate	.4465 Fail./Hr	
Total Abort Rate	.0181 Abort/Hr	
Failure Rate Distribution		
· Preflight		.03069F/Hr
· Inflight		.16333F/Hr
· Daily		.12093F/Hr
· PMI		.02213F/Hr
· PMP		.10942F/Hr
Number of Flights	5326	
Test Hop Flight Hours (Subcategory of the 9171.6 Flight Hours)	441.2 Hr	
Operating and Ready Hours	227,248 Hr	
Operational Availability = (227,248/417,048) x 100	54.5%	
NORS	86,725 Hr	
NORM	26,613 Hr	
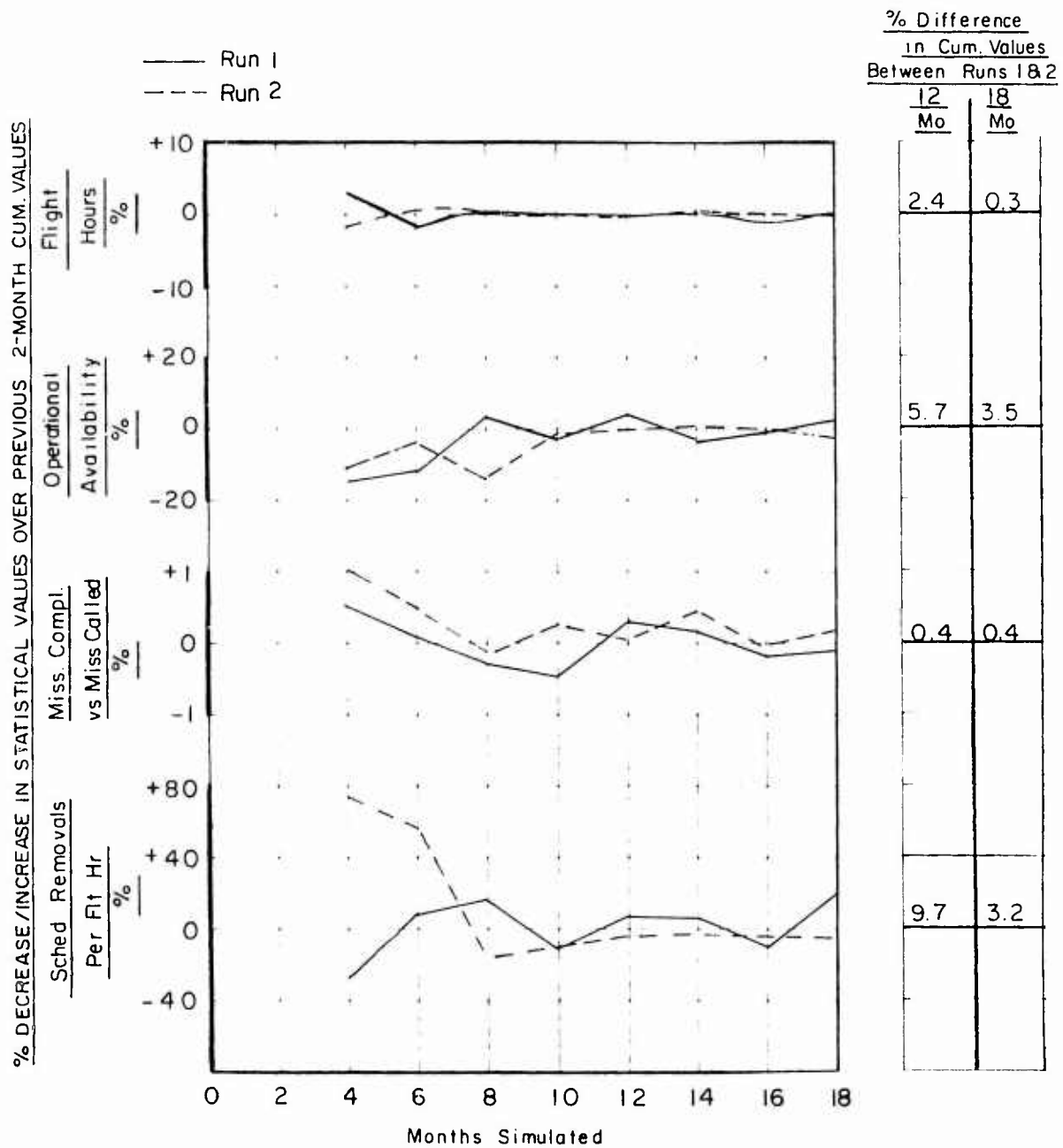
Figure 2.   Convergence of CH-54B/R&M Model
Output Statistics.
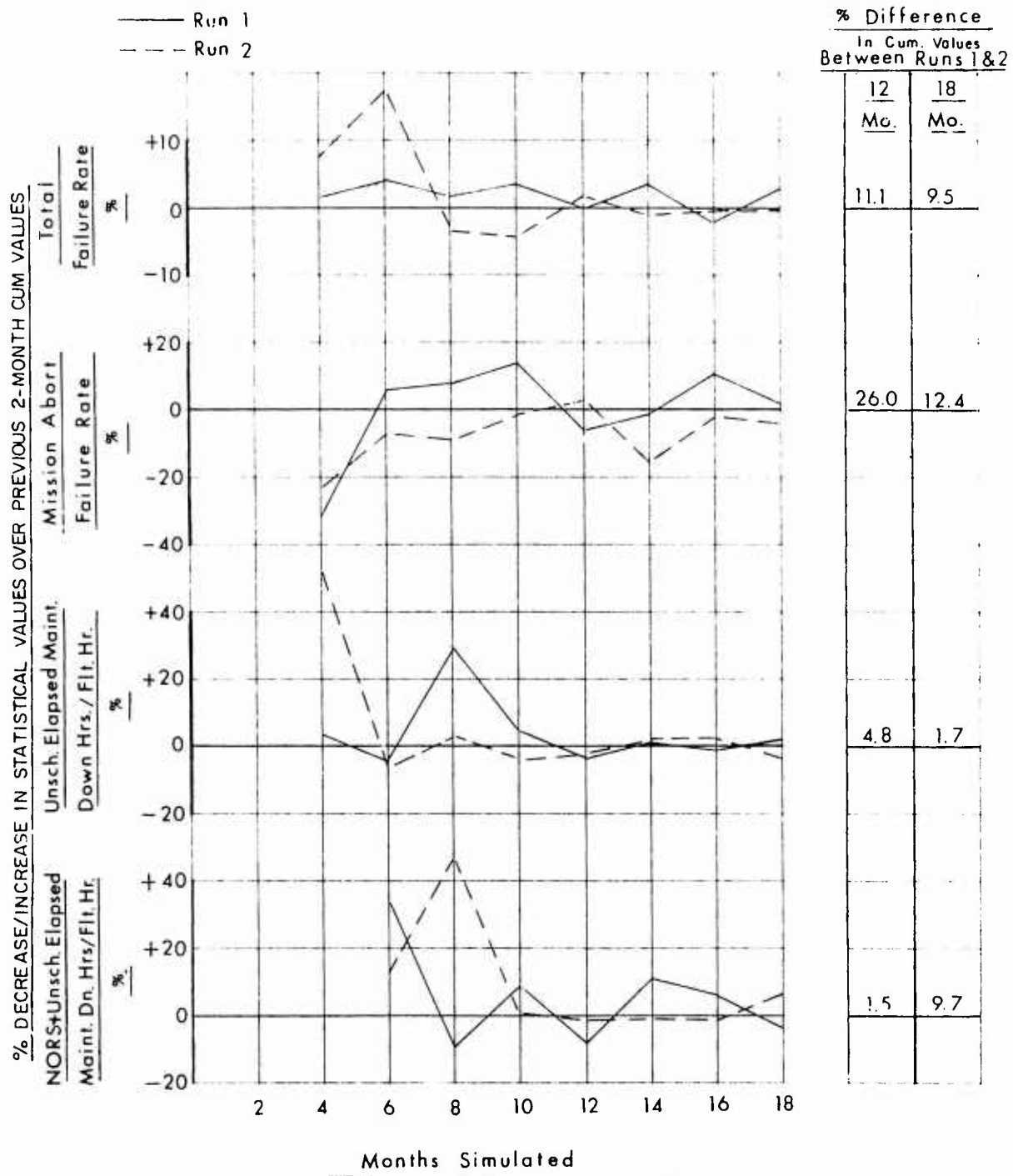
Figure 2. (Continued)

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the 10th through 18th month region. Least squares trend lines using the data from the 10th through the 18th month were computed and drawn. The differences in statistical values between the two runs are shown in Figure 3, together with the trend lines. Based on these trend lines, about a 25 percent reduction in scatter between the two runs, when averaged over all eight statistical trends studied, was achieved. Operational availability and mission accomplishment did not exhibit the characteristic improvement, however, the fluctuation of these statistics is such that exceptions to the normal trend will frequently occur. The important fact is that a general improvement in statistical scatter has been achieved by extending the simulated duration to 18 months. Therefore, to help guard against the adverse effects of large variation, the 18-month runs were considered desirable and were used in the subsequent studies.

Table III compares the baseline simulation model statistics with expected baseline values. Four separate 18-month simulation runs were made with the CH-54B baseline model with the random number seed changed. These four runs permitted the evaluation of the error inherent in the simulation model itself. Table III shows the expected values for the subject baseline model and the simulation deviation allowed from the expected values as determined from the four simulation runs referred to above. If the specific simulation run output statistics deviate from the expected values by more than the allowable values, the run is judged to be nonrepresentative of the expected values and further refinement of the model is required. The allowable deviation has been determined on a rigorous statistical basis and conforms to a level of significance criteria of $\alpha = .01$. This means, given that the model is truly representative of the expected values, there is only a 1% chance that a specific simulation statistic will deviate from the expected value by more than the allowable deviation value. Conversely, since this possibility is so remote, if a value does fall outside the allowable limit there is sufficient statistical justification to conclude that the simulation model does not fully represent the expected value and further refinement is required.

After successive simulation iterations and refinements to the model, a baseline model was established in which all output statistics tested fell within the allowable statistical limits; i.e., the resultant model was found to adequately represent the inherent R&M characteristics of the CH-54B when flown in accordance with those operational conditions reflected in the ORME operational data. As indicated above, Table V shows the allowable deviation and the actual difference recorded between the baseline model statistics and the expected values. In all cases these differences were within the allowable deviation, thus giving statistical credibility to the baseline model as adequately representing the expected values.

SENSITIVITY ANALYSES OF THE CH-54B MODEL USING FACTORIAL ANALYSIS APPROACH

Two factorial analyses were selected for study, one having quantitative input levels of utilization, failure rate and not operationally ready due to spares (NORS) varied, and the second having the qualitative factors of major inspection maintenance concepts, elapsed repair/replacement time distributions, and on-condition removals studied.

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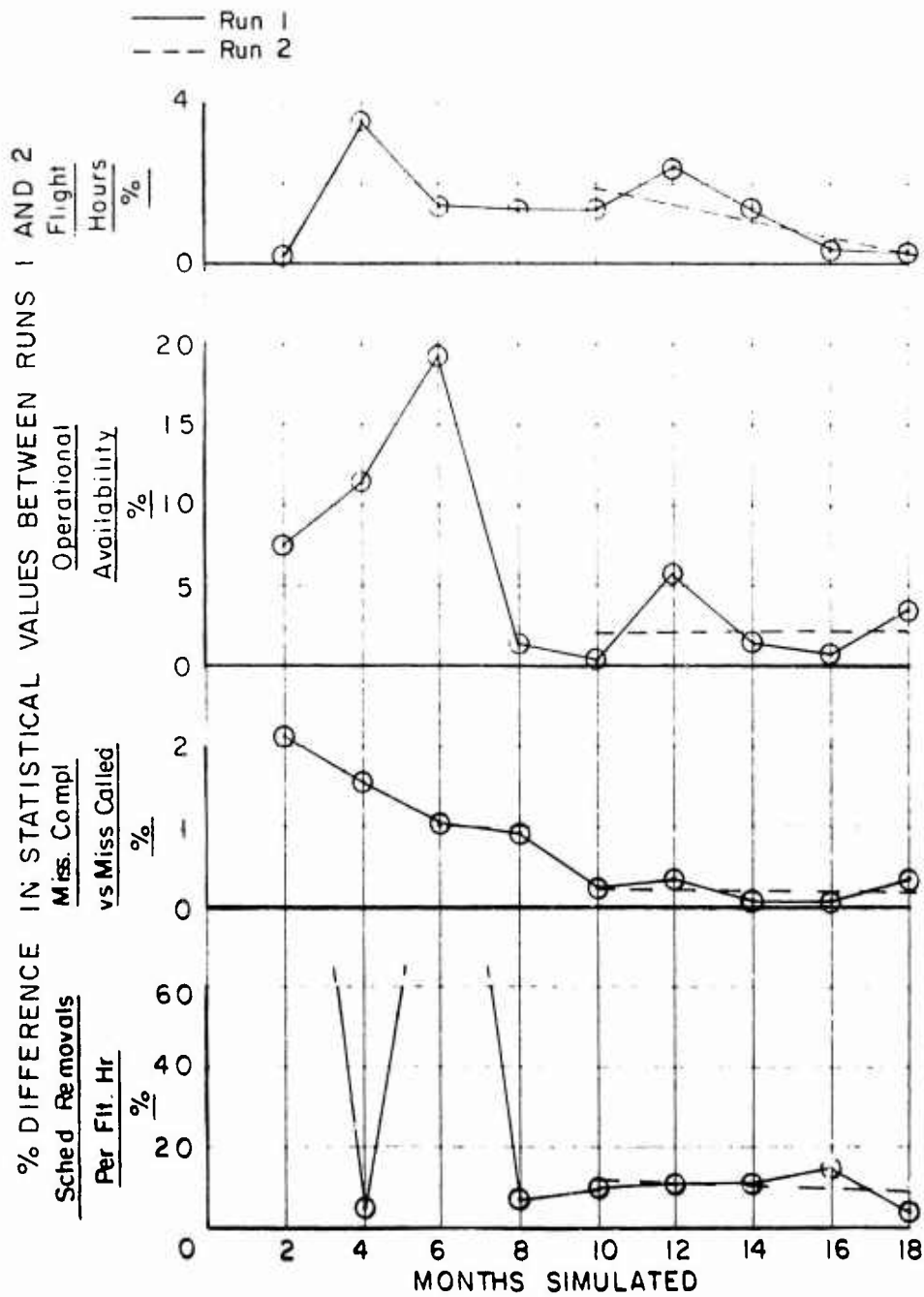
Figure 3. Percentage Difference Between
Statistical Output of the Two Stability
Runs with Least-Squares Fit.

23
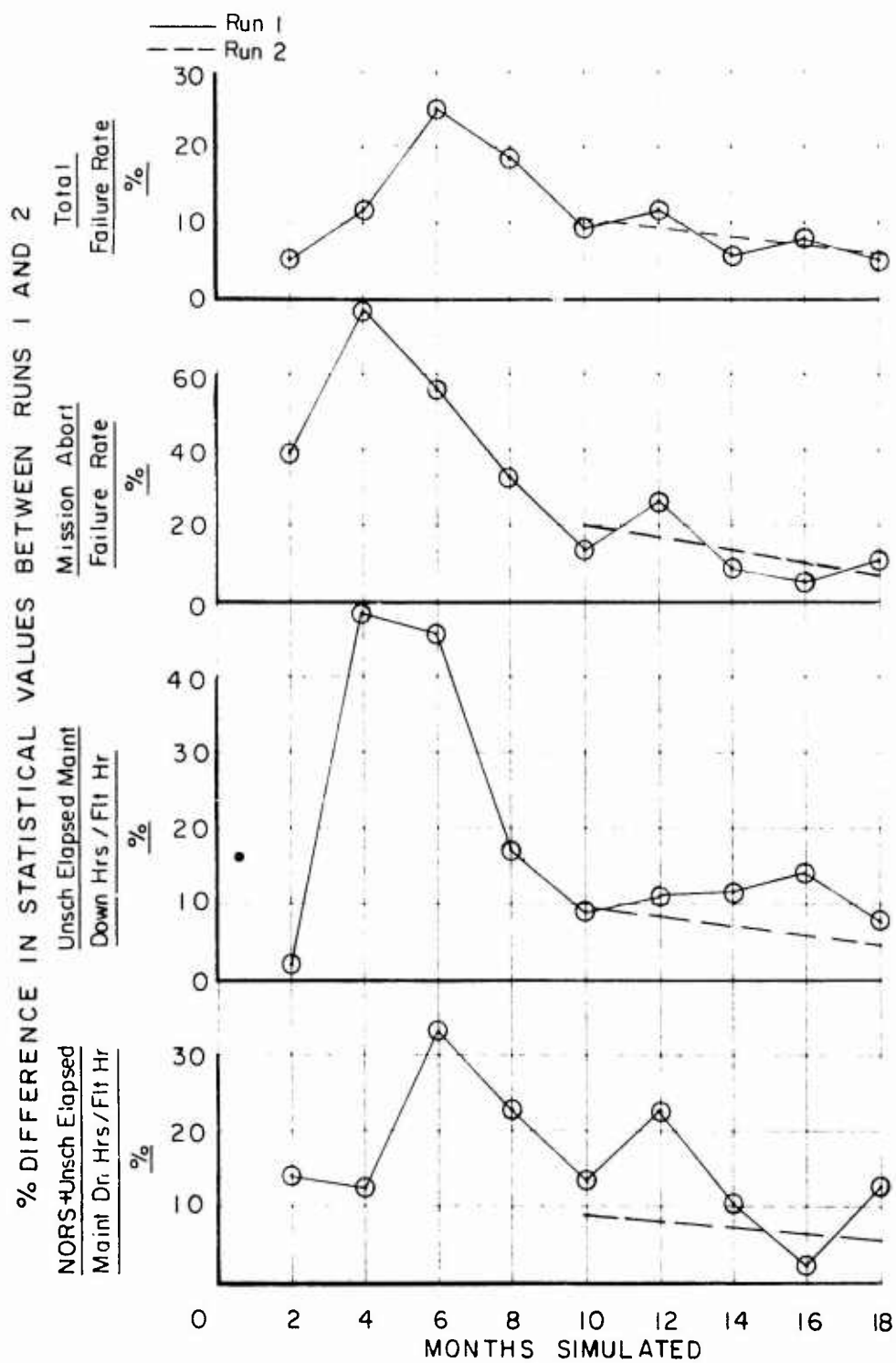
Figure 3. (Continued)

TABLE III. COMPARISON OF BASELINE SIMULATION MODEL STATISTICS WITH EXPECTED BASELINE VALUES

Output Parameter Measured	18-Month Operation		Allowable Error 99% Level	Actual Error
	Baseline Expected Values	Simulation Statistics		
Utilization - Flt. Hr	2394	2380	±37	14
Failure Rate - Fail./Hr	.4465	.4311	±.0438	.0154
Failures	1069	1026	±93	43
Failures by When Discovered				
Preflight	73	83	±22	10
Inflight	391	405	±31	16
Daily Inspection	290	286	±20	4
PMI Inspection	53	43	±10	10
PMP Inspection	262	209	±86	53
Abort Failure Rate - Fail./Hr	.0181	.0172	±.0064	.0009
Abort Failures	43	41	±13	2
Average Flight Duration - Hr	1.722	1.736	±.040	.014
Test Hop Proportion - %	4.81	4.51	±1.08	.30
Operational Availability - %	54.5	56.6	±5.1	2.1

The first factorial analysis was originally set to study the effects on operational availability and other output statistics caused by changes to the baseline ranging from -25 to +25 percent for NORS and 0 to +20 percent increase in utilization and failure rate. These points of consideration were the corners of the right-hand cube shown in Figure 4. When these test conditions were studied, an upper bound was discovered to exist beyond which the company unit utilization could not be reached. This required a change in the study points for the factorial analysis from a center point that measured the baseline (BL) plus 10 percent utilization and an upper set of points that evaluated BL plus 20 percent utilization to equivalent points for the factorial analysis measuring BL minus 10 percent and BL minus 20 percent. In Figure 4 the left hand cube shows the changes required in the test region due to the utilization limit. Figure 5 shows each of the test conditions simulated and studied. These test conditions are identified in terms of flight hours per aircraft per month for utilization, failures per hour for failure rate, and percentage increase/decrease in NORS for supply. Table IV shows these test condition values and the associated expected values of key operational parameters. The test conditions were simulated for the revised set of study points. Test point 5 was repeated four times and Table V shows the results. These four runs were discussed in relation to measuring the simulation error relative to the baseline run and are used throughout the analysis to justify computer runs being sufficiently close to the expected values to be statistically acceptable at the .01 level of significance. To compute the 1 percent level of significance, the standard deviation was computed for each significant statistic and multiplied by the normal distribution coefficient of 2.576, which corresponds to the 1 percent level of significance. As indicated above, all baseline values were checked with this deviation criterion to prove that the simulation results were sufficiently close to the expected values to be accepted as representative of the ORME operational statistics expected values.

Iterative computer runs were made at each of the study points until they were in the region of acceptability. One point was found to be out of limits. Condition 3, which was felt to be influenced by the utilization boundary, was out of limits. However, this point was accepted for the analysis because the expected flight-hour value could not be reached despite several attempts to get closer to the expected value. Saturating the flight schedule would permit the flight-hour value to be reached, but this would distort other important output statistics such as mission completion values. Although the analysis is slightly distorted by the use of this study point result, the distortion was not considered, in an analysis of this sort, to be sufficient to seriously jeopardize the overall study results. In the factorial analysis employed, the low and high utilization points are averaged over four values each, and therefore, any error is desensitized by this averaging process. Table VI shows the simulation statistics generated for the various test conditions. Table VII shows the difference between the values expected at each study point and those observed after successive iterations. Test point 1 shows an out-of-tolerance condition for inflight failures, but since at the total failure level the number of failures observed was in tolerance, the run was considered to be acceptable. It should be noted that Table VII defines over 100

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Incr
NORS

Approximate
Utilization
Limit

Incr
FR

Increasing
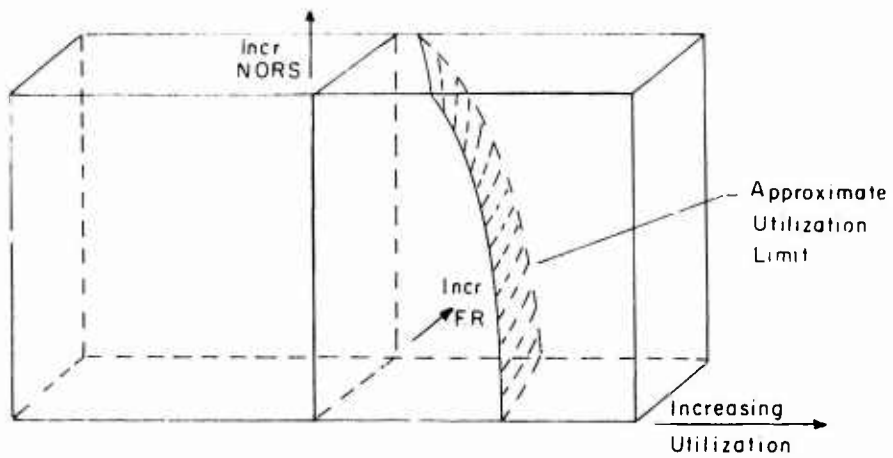
Utilization

Figure 4.   Utilization Boundary.

Increasing
NORS

(17 7, 491,+25%) ⑧   ③ (14.8, 491,+25%)

(17 7, 402,+ 25%) ⑦   ② (14.8, 402,+25%)

(16.3, 447, 0%)
x x
x x
5

BASE
LINE

Increasing
Failure Rate

(17 7, 491, -25%) ⑨   ④ (14.8, 491, -25%)

TEST REGION   Increasing

(17 7, 402, -25%) ⑥   ①   Utilization

(14.8, 402, -25%)
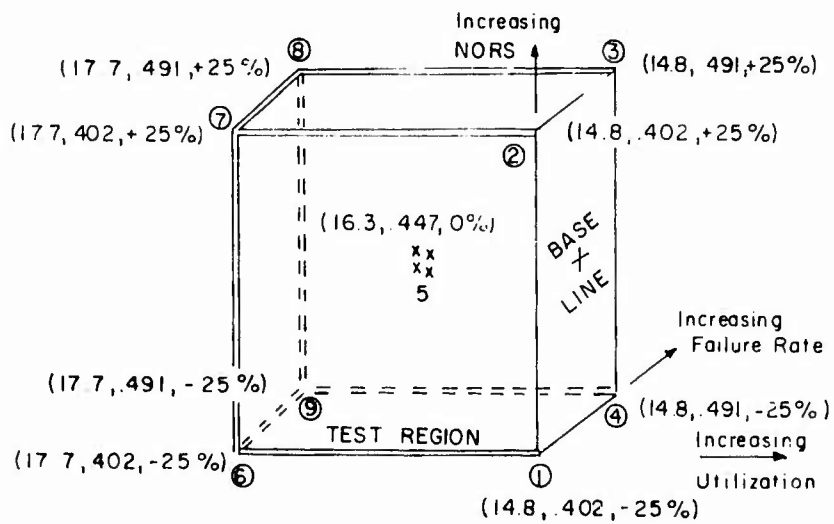
Figure 5.   Test Region Studied.

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TABLE IV. SIMULATION STATISTICS - COMPARISON OF EXPECTED
VALUES AND SIMULATION STATISTICS FOR FACTORIAL TEST POINTS

FACTORIAL TEST POINT	BASELINE BL	1 EXPECTED	1 ACTUAL	2 EXPECTED	2 ACTUAL	3 EXPECTED	3 ACTUAL
Test Condition							
Utilization, Flight Hours	2394		2394*		2394		2394
Failure Rate, F/FH	.4465		.4019		.4019		.4912
NORS (observed CH-54B)							
Output Values							
Utilization, Flight Hours	2394	TC	2399	TC	2376	TC	2295
Failure Rate, F/FH	.4465	TC	.3718	TC	.4086	TC	.4750
NORS		TC		TC		TC	
Failures By When Found							
Preflight Inspection	.0305	.0276	.0313	.0276	.0337	.0338	.0366
Inflight	.1633	.1470	.1317	.1470	.1435	.1796	.1678
Daily Inspection	.1211	.1086	.1100	.1086	.1141	.1332	.1329
PMI Inspection	.0221	.0200	.0200	.0200	.0194	.0242	.0222
PMP Inspection	.1094	.0986	.0788	.0986	.0981	.1203	.1155
Abort Failures	.0200	.0163	.0138	.0163	.0119	.0201	.0205
Avg Flt Duration, Hour	1.722	BL	1.75	BL	1.74	BL	1.73
Test Hop Prop., %	4.81	BL	4.15	BL	4.03	BL	5.13
Operational Avail, %	54.5	MEAS	65.46	MEAS	58.61	MEAS	50.02

TC = Test Condition
* 2394 Flight Hours = 2394/(9 Aircraft x 18 Months) = 14.8 Flight Hours per Aircraft per Month.
(Shown in Figure 4)

TABLE IV (Continued)

FACTORIAL TEST POINT	BASELINE * (BL)	4		5		6	
		EXPECTED	ACTUAL	EXPECTED	ACTUAL	EXPECTED	ACTUAL
Test Condition							
Utilization, Flight Hours	2394		2394		2155		1915
Failure Rate, F/FH	.4465		.4912		.4465		.4019
NORS (observed CH-54B)							
Output Values (18-month Simulation)							
Flight Hours	2394	TC	2409	TC	2142	TC	1912
Failure Rate, F/FH	.4465	TC	.4698	TC	.4679	TC	.4033
NORS		TC		TC		TC	
Failures By When Found							
Preflight	.0305	.0338	.0374	.0306	.0336	.0278	.0303
Inflight	.1633	.1796	.1785	.1633	.1657	.1467	.1616
Daily Inspection	.1211	.1332	.1312	.1206	.1242	.1091	.1067
PMI Inspection	.0221	.0242	.0224	.0218	.0229	.0198	.0188
PMP Inspection	.1094	.1203	.1005	.1109	.1214	.0987	.0858
Abort Failures	.0200	.0201	.0145	.0181	.0182	.0162	.0115
Avg Flt Duration, Hr.	1.722	BL	1.74	BL	4.62	BL	4.15
Test Hop Prop., %	4.81	BL	4.85	BL	55.98	BL	70.63
Operational Avail., %	54.5	MEAS	57.93	MEAS	55.98	MEAS	70.63

*Repeated for reference.

TC = Test Condition

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TABLE IV (Continued)

FACTORIAL TEST POINT	BASELINE* (BL)	7		8		9	
		EXPECTED	ACTUAL	EXPECTED	ACTUAL	EXPECTED	ACTUAL
Test Condition							
Utilization, Flight Hours	2394		1915		1915		1915
Failure Rate, F/FH	.4465		.4019		.4912		.4912
NORS (observed CH-54B)							
Output Values (18-month Simulation)							
Flight Hours	2394	TC	1911	TC	1930	TC	1910
Failure Rate, F/FH	.4465	TC	.3971	TC	.4688	TC	.4742
NORS		TC		TC		TC	
Failures By When Found							
Preflight	.0305	.0277	.0220	.0339	.0285	.0339	.0330
Inflight	.1633	.1467	.1575	.1796	.1663	.1796	.1686
Daily Inspection	.1211	.1091	.1073	.1332	.1409	.1332	.1382
PMI Inspection	.0221	.0200	.0183	.0240	.0264	.0240	.0277
PMP Inspection	.1094	.0987	.0921	.1206	.1078	.1206	.1068
Abort Failures	.0200	.0162	.0194	.0200	.0223	.0200	.0157
Avg Flt Duration, Hr.	1.722	BL		BL		BL	
Test Hop Prop., %	4.81	BL	4.15	BL	4.58	BL	4.70
Operational Avail., %	54.5	MEAS	60.99	MEAS	54.97	MEAS	66.90

*Repeated for reference.
TC = Test Condition

TABLE V. ANALYSIS OF SIMULATION ERROR

STATISTIC	EXPECTED VALUE	CENTER POINT WITH DIFF. RANDOM NOS.*				MEAN	ST. DEV.	1% LEVEL OF SIGN +Δ
		A	B	C	D			
Utilization, Flight Hours	2154.7	2141.5	2173.0	2148.2	2144.6	2151.8	14.39	37.07
Failure Rate, F/Flt. Hr	.4465	.4679	.4463	.4296	.4350	.4447	.0170	.0438
Failures (Total)	962	1002	970	923	933	957.00	36.18	93.20
Failures by When Found	-	-	-	-	-	-	-	-
Preflight Inspection	66	72	80	62	63	69.25	8.46	21.79
Inflight	352	355	332	334	352	343.25	11.93	30.73
Daily Inspection	261	266	263	264	280	268.25	7.93	20.43
PMI Inspection	48	49	42	49	49	47.25	3.70	9.52
PMP Inspection	236	260	253	214	189	229.00	35.96	86.24
Abort Failure Rate,A/Flt Hr	.0181	.0182	.0143	.0139	.0186	.0163	.0025	.0064
Abort Failures	39	39	31	30	40	35.00	5.23	13.47
Avg. Flt Duration, Hr	1.722	1.731	1.747	1.752	1.718	1.7370	.0155	.0399
Test Hop Proportion, %	4.81	4.62	4.27	4.09	5.05	4.51	.42	1.08
Operational Availability, %	-	55.98	58.48	54.06	57.95	56.618	2.016	5.193

* 18 Month Runs Using Different Random Number Sets.

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TABLE VI.   SIMULATION STATISTICS FOR VARIOUS TEST CONDITIONS

	Test Point *								
	1	2	3	4	5	6	7	8	9
Test Condition									
Utilization, Flight Hours	2394	2394	2394	2394	2155	1915	1915	1915	1915
Failure Rate, F/Flt. Hr	.4019	.4019	.4912	.4912	.4465	.4019	.4019	.4912	.4912
NORS (Observed CH-54B=100%)	75%	125%	125%	75%	100%	75%	125%	125%	75%
Observed Values									
Utilization, Flight Hours	2399	2376	2295	2409	2142	1912	1911	1930	1910
Failure Rate, F/Flt. Hr	.3718	.4086	.4750	.4698	.4679	.4033	.3971	.4688	.4742
Failures (Total)	892	971	1090	1132	1002	771	759	905	906
Failures by When Found	-	-	-	-	-	-	-	-	-
Preflight Inspection	75	80	84	90	72	58	42	55	63
Inflight	316	341	385	430	355	309	301	321	322
Daily Inspection	264	271	305	316	266	204	205	272	264
PMI Inspection	48	46	51	54	49	36	35	51	53
PMP Inspection	189	233	265	242	260	164	176	206	204
Abort Failures	33	28	47	35	39	22	37	43	30
Avg. Flt. Duration Hrs	1.75	1.74	1.73	1.74	1.73	1.75	1.74	1.74	1.73
Test Hop Proportion, %	4.15	4.03	5.13	4.85	4.62	4.48	4.15	4.58	4.70
Operational Availability	65.46	58.61	50.02	57.93	55.98	70.63	60.99	54.97	66.90

* As defined in Table IV.

TABLE VII. COMPARISON OF ACTUAL DIFFERENCE OF EXPECTED AND OBSERVED VALUES AND THE ALLOWABLE DIFFERENCE

	Allow. Error	Actual Test Point Errors								
		1	2	3	4	5	6	7	8	9
Utilization, Flight Hours	37	5	18	99	15	13	3	4	15	5
Failure Rate, F/Flt. Hr	.0438	.0301	.0067	.0161	.0214	.0233	.0011	.0046	.0224	.0179
Failures (Total)	93	70	9	44	86	38	1	11	35	36
Failures By When Discovered										
Preflight Inspection	22	9	14	3	9	6	5	11	10	2
Inflight	31	36	11	45	0	3	26	20	23	22
Daily Inspection	20	4	11	14	3	6	5	4	17	9
PMI Inspection	10	0	2	7	4	2	2	3	5	1
PMP Inspection	86	47	3	17	16	21	25	13	25	21
Abort Failures	13	6	11	1	13	0	9	6	5	5
Avg. Flight Duration, Hr	.040	.029	.036	.008	.009	.009	.024	.020	.020	.011
Test Hop Proportion of Total Flight Time, %	1.08	.66	.78	.04	.32	.19	.33	.66	.23	.11

tests of significance at the 1 percent level; therefore, it is highly likely that one statistic in 100 would be found slightly out-of-tolerance. Test point 3 has already been noted. After several iterations, the computer run exhibiting the closest value to the expected utilization was chosen for the analysis with the recognition that some error would be introduced into the analysis.

The first factorial analysis includes a study of the eight basic factorial analysis points to ascertain how, for example, the simulation output operational availability changes in relation to discrete changes in utilization, failure rate and NORS levels. It also includes the incorporation of the center point data to assess the curvature associated with the surfaces reflecting constant operational availability. The definition of operational availability used here is

$$\text{Operational Availability} = \frac{\text{Flight Time + Ready Time}}{\text{Flt. Time + Ready Time + Corr. Maint. + Prevent Maint. + Supply \& Admin. Downtime}}$$

Table VIII shows the factorial analyses results for operational availability. Table XIII in Appendix V shows in expanded arithmetic detail the information contained in Table VIII. The values for availability have been taken from Tables V and VI. Several observations must be made before proceeding. First, from a statistical viewpoint, there are eight degrees of freedom (df) associated with the data shown in the "Aircraft Availability Values" column since the data is derived from eight distinct test points. In the center point evaluation of the simulation error, four test points, and therefore a df of four, are reflected: one associated with the mean and three associated with the variance. Using an F level of significance test, the computed effects can be analyzed to determine whether they are true effects or simply perturbations due to simulation error. Bases on an $\alpha = .05$ and the df information above, if the F statistic (equal to the mean square value divided by the simulation error) exceeds the F distribution value for a .05 level of significance with 1 df in the numerator and 3 df in the denominator, then the effect associated with the mean square is judged to be a real effect. The critical $F_{1,3}$ distribution value for $\alpha = .05$ is 10.1, and the F statistic in the case of the NORS effect is 167.72/4.06, or 41.3. Therefore, the change in operational availability due to the computer input change in NORS level is real, and the best estimate of this change is -9.16 percent in operational availability when the NORS level is changed from its low to its high value. The changes in operational availability due to changes in failure rate and utilization are also found to be real.

This information coupled with the center point data permitted the drawing of operational response surfaces. These surfaces are shown in Figure 6 together with the contour lines of constant operational availability displayed on each face of the cubic space studied.

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TABLE VIII. FACTORIAL ANALYSIS OF OPERATIONAL AVAILABILITY

TEST POINT (Table VII)	TEST X1 NORS	FACTOR X2 FAIL RATE	X3 LOW UTIL	AIRCRAFT AVAILABILITY VALUES (From Sim.Runs)	TEST FACTOR INTERACTIONS	F STATISTIC	ESTIMATE OF CHANGE
6	BL-25%	BL-10%	BL-20%	70.63	Average Response		60.65
7	BL+25%	BL-10%	BL-20%	60.99	X1	*41.3	-9.16
9	BL-25%	BL+10%	BL-20%	66.90	X2	*20.1	-6.39
8	BL+25%	BL+10%	BL-20%	54.97	X1, X2	0.3	-0.76
1	BL-25%	BL-10%	BL	65.46	X3	*14.6	-5.44
2	BL+25%	BL-10%	BL	58.61	X1, X3	1.3	1.63
4	BL-25%	BL+10%	BL	57.93	X2, X3	1.1	1.52
3	BL+25%	BL+10%	BL	50.02	X1, X2, X3	0.1	0.38

Operational Availability for Center Point (RMULT Runs): 55.98, 58.48, 54.06, 57.95
Mean Op Avail = 56.62%   St. Dev = 2.016 (3 Degrees of Freedom)
α = .05 Critical Value for $F_{1,3}$ = 10.1
Center Point Variance = 4.06
*Real Effect
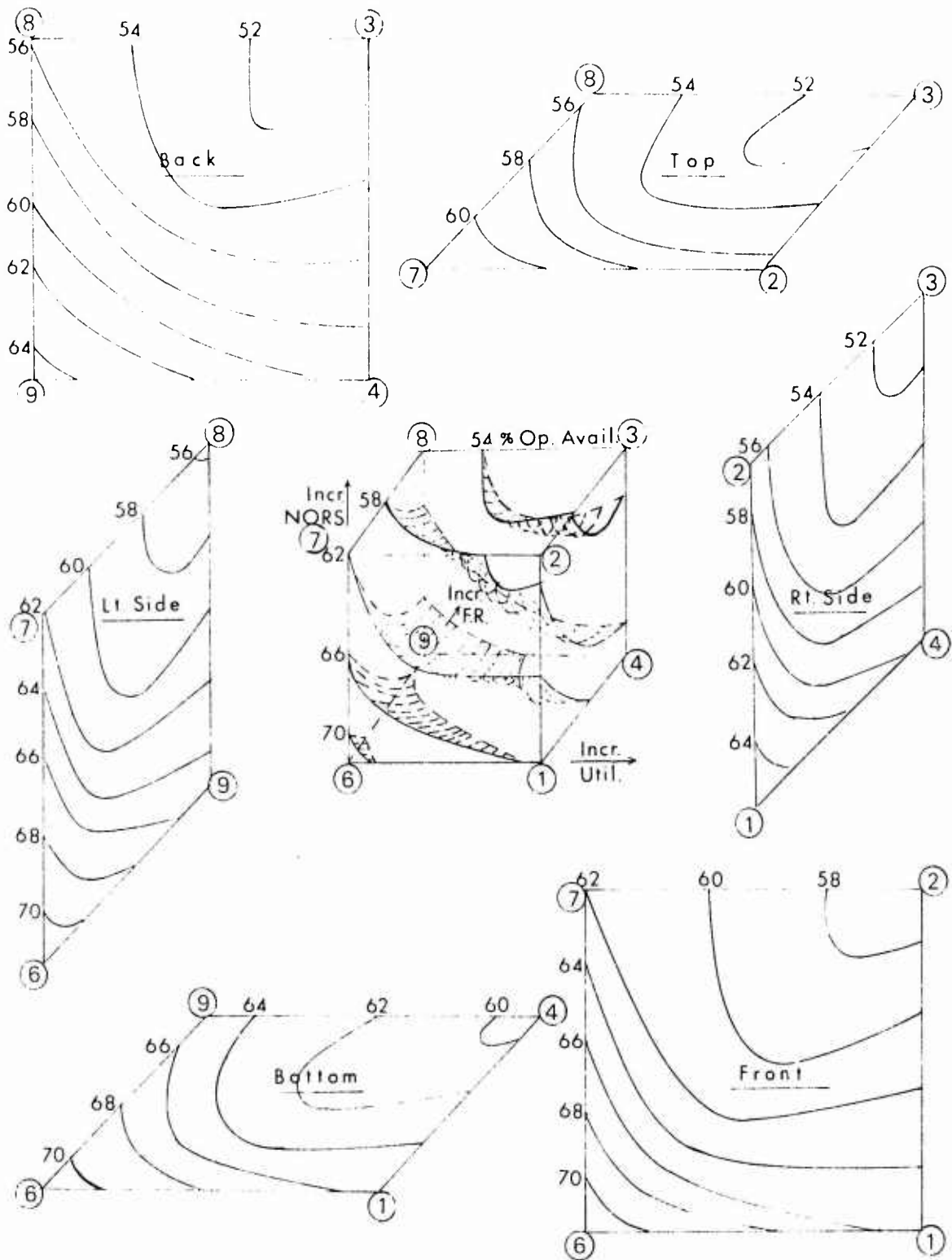
Figure 6. Operational Availability Contours.

From the analysis of the first factorial arrangement as it applies to operational availability, the following conclusions are drawn.

(1) The simulation error in relation to the operational availability model output is large and hampers the ability of the model to measure the effects of major changes in aircraft R&M characteristics. As a consequence, the contour lines and surfaces of constant operational availability shown in Figure 6 must be somewhat uncertain.

(2) Despite the large simulation error, the model yields consistent results; for example, decreasing the utilization by 20 percent has approximately the same effect on operational availability as decreasing failure rate by 20 percent. The utilization decrease results in about 5.4 percentage decrease in availability; failure rate results in about 6.4 percent. The NORS level was decreased about 40 percent and resulted in a proportional 9.2 percent increase in availability.

(3) The consistency is enhanced by the employment of the factorial arrangement. Although only eight test points were used to measure the effects of changes in utilization, failure rate, and NORS, the factorial arrangement permitted all eight test points, four at the low factor level and four at the high factor level, to be used to measure each factor response. This provided a major improvement in accuracy per test point over an arrangement which would measure each factor separately.

(4) Because of the high number of computer iterations required to "home in" on the factor levels of utilization and failure rate, especially failure rate, the study was limited to the factorial analysis indicated in the statement of work; however, a more forceful and exacting experimental design could be employed, if the required number of iteration runs could be cut down. The experimental design referred to is called the central composite design and is discussed in O. L. Daves book on Experimental Design.[4] This test design would provide a major improvement in computing the response surfaces. Figure 6 is simply a synthesis of the 8-point factorial analysis results shown in Table VIII and the center-point analysis also shown in that table.

To evaluate the overall sensitivity and credibility of the CH-54B model, several output parameters were evaluated on a statistical basis. Three levels of significance were used: $\alpha = .10$, where the results were considered to be significant; $\alpha = .05$, where the results were considered to be highly significant; and $\alpha = .01$, where the results were considered to be very highly significant. The reason for considering several levels of significance is that an overall appreciation of the model's output is the focal point of this part of the evaluation, rather than decisionmaking. In a decision situation, one level of significance would be chosen based on

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(4) Daves, Owen L., DESIGN AND ANALYSIS OF INDUSTRIAL EXPERIMENTS, Second Edition, New York, Hafner Publishing Company, 1963, pp 532-553.

the consequences of making a wrong decision. In this evaluation the interest lies in the question: do the expected effects show up using this model, and how pronounced are those effects? In other words, are the effects believable, and how sensitive is the model to changes in aircraft quality or operational conditions? Table IX contains a listing of the effects shown to be significant, and Appendix V shows the computational detail establishing these effects as significant.

Failure rate, utilization, and NORS waiting time were the factors varied. The output values selected for study were unscheduled elapsed maintenance down hours; NORS hours plus unscheduled elapsed maintenance down hours; percentage of intrinsic availability where intrinsic availability measured the proportion of flight hours to flight hours plus unscheduled down hours and also the proportion of flight hours to flight hours plus scheduled and unscheduled down hours; direct maintenance man-hours per flight hour; percentage of mission accomplishment; and finally, observed NORS hours.

Table IX contains a summary of the responses found to be significant and estimates of these responses. The expected responses are summarized as follows. An increase in NORS waiting factor should adversely affect all the output statistics except those that measure active maintenance down time alone, namely, unscheduled elapsed maintenance down hours and direct maintenance man-hours per flight hour. An increase in failure rate should adversely affect all the output statistics. Finally, an increase in utilization should adversely affect all output statistics except intrinsic availability and direct maintenance man-hours per flight hour which would be expected to remain constant with increased flight hours.

The consistency of the actual significant effects with those expected is apparent. The major exception to this is in mission accomplishment, where it is expected that increases in NORS time, failure rate or utilization would cause less aircraft to be available and therefore less chance of performing and completing a mission that is called. In this instance it must be concluded that the model is not sensitive enough to measure the change in mission accomplishment for the changes in the levels of the factors analyzed. Another exception of concern was in direct maintenance man-hours per flight hour, where an increase in utilization has resulted in a decreased value for this statistic. Reflecting on the reasons that could cause this phenomenon led to an investigation of the difference in scheduled maintenance requirements per flight hour for both daily and preflight inspections. The four low utilization runs showed the need for .692 daily per flight hour and .727 preflight per flight hour, and the four high utilization runs showed .600 and .702 respectively. As the utilization goes up, therefore, the need for additional dailies and preflights goes up much more slowly, resulting in the lower scheduled maintenance man-hour per flight hour requirement. Table IX shows that the best estimate of the difference in direct maintenance man-hours per flight hour is -.57. Since it takes 5.4 man-hours per flight hour for performing daily inspections and 1.8 for preflights, the expected difference from this source should be

$$(.600 - .702)\ 5.4 + (.692 - .727)\ 1.8 = -.61$$

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TABLE IX

SIGNIFICANT EFFECTS FROM THE QUANTITATIVE FACTORIAL ANALYSIS

OUTPUT STATISTIC	EFFECTED X FACTOR	ESTIMATE OF EFFECT	SIGNIFICANCE OF EFFECT		
			NORS	FAIL RATE	UTIL
Unsched Active Elapsed Maint. Down Hours	Fail Rate	+1109		HS	
	Util	+1598			VHS
	NORS		N		
NORS + Unsched Elapsed Maint Down Hours	NORS	+8232	VHS		
	Fail Rate	+5711		HS	
	Util	+5292			HS
% Intrinsic Availability = (F.H./F.H. + Unsched. Down Hours)	NORS	-2.09	VHS		
	Fail Rate	-1.57		HS	
	Util				N
% Intrinsic Availability = (F.H./F.H. + Unsched. + Sched. Down Hours)	NORS	-1.76	VHS		
	Fail Rate	-1.34		HS	
	Util				N
Direct Maint. Man Hours/ Flt. Hr.	Fail Rate	+.28		S	
	Util	-.57			VHS
	NORS		N		
NORS Down Hours	NORS	+9888	VHS		
	Fail Rate	+6368		HS	
	Util				N

S   - Significant
HS - Highly Significant
VHS - Very Highly Significant
N   - Negligible

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Again this shows the consistency of the CH-54B model and shows that, relative to certain statistical output, the model has a very sensitive response.

The above analysis is a further indication of the areas of sensitivity and lack of sensitivity produced by the CH-54B model, and of the care that must be exercised in the interpretation of results relative to the simulation error. The factorial analysis method employed here provides a viable and efficient method of minimizing the effects of this simulation error and should be seriously considered for use in all subsequent simulation studies of this type.

CONCLUSIONS

Conclusions are presented for five general areas: the variation associated with the model; the adequacy of the CH-54B model; the conclusions derived from the factorial analysis varying factors of NORS waiting time, failure rate, and utilization; the conclusions derived from the factorial analysis varying factors of major inspection policy, TBO policy, and repair/replacement time distribution; and finally, the conclusions derived from the statistical methodology employed.

The CH-54B model evidences a very large variation in operational availability and other output statistics. A large part of this variation is associated with the use of the NORS and cannibalization subroutines. Also, a low daily utilization of aircraft contributes to this variation. Despite this variation, the model yields statistical output that is consistent with expected changes in operational parameters.

The CH-54B baseline model was verified to reflect known CH-54B field operation as reported by the ORME field data collection program. This verification of the baseline model established that, within the error inherent in the model itself, the utilization, failure rates, and other aircraft/operational parameters were found to be representative of the ORME field data.

The simulation error associated with CH-54B R&M simulation model output was large but, due to the improved ability of the factorial analysis procedure to measure operational responses, changes in NOR waiting time, failure rate, and utilization factors, provided statistical output that was consistent with expectations and was relatively sensitive. For example, increasing either utilization, failure rate, or NORS waiting time by 20% produced about the same net effect of decreasing operational availability by 5%. This consistency and sensitivity were true for all statistical output studies, which included measures of intrinsic availability, direct maintenance man-hours per flight hour, unscheduled elapsed maintenance down hours, and not operationally ready time due to spares. The lone exception to this sensitivity was in the measurement of mission accomplishment (ratio of missions called to missions completed). Increased NORS waiting time, failure rate, or utilization would be expected to reduce mission accomplishment, but it was found that the model was not sufficiently sensitive for the prescribed 18-month simulation operation to measure this reduction.

The final conclusion is that statistical procedures are required to analyze the R&M model simulation output if real effects are to be discerned from random scatter and that factorial analysis is an important statistical procedure to minimize the required number of simulation runs.

RECOMMENDATIONS

1. The CH-54B model, which incorporates NORS data, evidences large variability in its simulated output, making it difficult to measure effects and creating an unnecessary number of iterative runs to home in on the failure rates associated with the specific condition simulated. This large variability is associated with how the basic R&M model is constructed and is inherent in the UH-1N model as well as the derivative CH-54B model. In the daily inspection, for example, a probability distribution of the number of failures is input to the model based on an expected number of daily inspections. Since the number of dailies can easily vary by 7%, as is reflected in Table VIII in the spread of daily inspections for different random number seeds, this variability is added to that created by the probability distribution of the number of failures. This probability distribution reflects the Poisson distribution based on the exponential time to failure, which implies a totally random occurrence of failure. The Poisson probability distribution already reflects the maximum spread of failure rates that should be expected. The introduction of variation due to the number of dailies unnecessarily and unrealistically magnifies this variability. It is recommended, therefore, to substantially reduce the computer time for the same simulation accuracy or, conversely, to substantially improve the accuracy for the same simulation time, that the model be changed in the method of simulating failures. Rather than simulating the number of failures each time a daily occurs, simulate failures independently of the events and then assign them on a probability distribution basis to the various events. This approach would not only eliminate unrealistic model variability, but would do it in a way that would simplify the model input function requirements.

The Reliability and Maintainability (R&M) Model currently used by the Eustis Directorate, USAAMRDL, has been modified to incorporate the failure methodology outlined above. The GAMMA distribution is used to compute the time to next failure, for each component, in terms of aircraft operating hours. When the aircraft reaches the precomputed operating hours, the component fails. Monte Carlo techniques are employed to determine if the failure is discovered at the time of failure, in subsequent missions, or in an inspection event, such as daily, preventive maintenance periodic (PMP), etc. The failure is placed on a list of other failures awaiting discovery when the appropriate event occurs.

2. It is further recommended that a statistical methodology be established for use in subsequent studies employing the R&M simulation model or the ARMS model. This methodology should be based on the statistical procedures put forth in this study. This methodology should encompass:

   a) Evaluation of simulation error.
   b) Validation of baseline model as consistent with expected values using a level of significance criterion in conjunction with simulation error measurement.
   c) Use of factorial analysis procedures to evaluate alternative operational conditions.

d) Use of central composite design where response surface studies are desirable.

The establishment of such a statistical methodology would substantially enhance the efficiency of performing these studies, would produce improved sensitivity analyses, and would provide a better grasp and understanding of the trends brought about by changes in aircraft/operational characteristics.

APPENDIX I
ELEMENT IDENTIFICATION AND FAILURE RATE

Table X contains the numerical codes used to identify the subsystems and elements of the CH-54B. The element nomenclature and the failure rate associated with each element are identified in this table.

TABLE X. ELEMENT IDENTIFICATION AND FAILURE RATE

CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.
01-	AIRFRAME	(23.99)
-01	R. H. Cockpit Door Sliding Window	.981
-02	L. H. Windshield Assy	.327
-03	Personnel Door Assy	.981
-04	Lower Cockpit Avionics Door Seal	.436
-05	STA 229 Frame Assy	.218
-06	Stringer-Fwd Frame Assy	.218
-07	Support-Fwd Frame Assy	.327
-08	Fwd Fuselage Work Platform Assy	.654
-09	Rt. Top Fuselage Util. Hyd. Cover Assy	1.963
-10	Lt. Top Fuselage Util. Hyd. Cover Assy	1.636
-11	Compass Flux Valve Support Assy	.327
-12	Lower Tail Pylon Bulk Head Assy	.218
-13	Fitting Assy, Stabil. Aft. Spar	.109
-14	Sleeve Bushing, Stabil. Aft. Spar	.109
-15	L. H. Land. Gear Support Strip	.109
-16	R. H. Land. Gear Support Strip	.109
-17	R. H. Land. Gear Upper Fwd Fairing Assy	.218
-18	R. H. Land. Gear Fwd Fairing Frame	.327
-19	Pilot Inertia Reel	18
-20	Airframe Catchall	14.501
02-	LANDING GEAR	(27.06)
-01	Nose Wheel Centering Lock Cable	.109
-02	Nose Wheel Lock Control Handle	.327
-03	Nose Gear Lock Mech.	.327
-04	Nose Wheel Lock Bellcrank	.458
-05	Nose Gear Ski Cable	.218
-06	Nose Wheel Tire	.327
-07	Main Land. Gear Scissors Bolt	.327
-08	Nose Gear Torque Arm Bushing	.218
-09	Main Land. Gear Torque Arm Bushing	.436
-11	Parking Brake Valve	.872
02-12	Main Wheel Brake Disc	2.181
-13	Wheel Brake Pwr. Boost Cylinder Piston Seal	.436
-14	Copilot's Pwr. Boost Cylinder	1.963
-15	Wheel Brake Pwr. Boost Cylinder Internal Seal	.545
-16	Main Wheel Tire-Type 3	1.527
-17	Main Wheel Tire-Type III	3.816
-18	Main L. G. Brake Pucks	.545
-19	Main L. G. Wheel Brake Assy	.654
-20	Tail Skid Upper Yoke Bushing	.327
-21	Tail Skid Attachment Bushing	.327
-22	Tail Skid Brace Assy Bushing	.65+
-23	Tail Skid Actuator	.763
-24	Land. Gear Catchall	9.704
03-	MECHANICAL FLT. CONTROL	(10.43)
-01	Collective Stick Boot	.436
-02	Coll. Stick Grip Switch	.109
-03	Coll. Friction Lock Sleeve Assy	.218
-04	Coll. Friction Lock Collet	.763
-05	Rt. Lat. Control Servo Rod End Bearing	.218
-06	Cyclic Pitch Control Connecting Rods	.436
-07	Lt. Lat. Control Servo Rod End Bearing	.163
-08	Rt. Lat. Cyclic Control Bellcrank	.218
-09	Aft Tail Cone Rt. Directional Control Cable	.218
-10	Rt. Fwd. Upper Deck Directional Control Cable	.327
-11	Aft Tail Cone Lt. Directional Control Cable	.218
-12	Directional Control, Rod End Bearing	.349

CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.	CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ... F...
03-13	Mech. Flt. Control Catchall	6.760	05-	APP INSTALLATION	(9.35)
			-01	APP Shutoff Valve	.327
04-	ROTORS/BLADES	(50.26)	-02	APP Start Accumulator	.763
-01	Main Rotor Head	2.399	-03	APP Starter	3.053
-02	Rotating Swash Plate Control Arm Bearing	.436	-04	APP Starter Drive Coupling	.215
-03	Pitch Control Rod Boot	.436.	-05	APP Engine Mount Strut Assy	.215
-04	Sleeve and Spindle Assy	2.181	-06	APP Aft Mount Rod End Upper Bearing	1.199
-05	Main Rotor Damper Assy	1.090	-07	APP Aft Mount Rod End Lower Bearing	2.072
-06	M. R. H. Pitch Change Link	.654	-08	APP Installation ...	1.527
-07	Sleeve and Spindle Oil Seal	5.452			
-08	Rotating Scissors Laminated Shim	1.090	06-	TRANSMISSION	(48.19)
-09	Rotating Scissors Link Assy	1.199	-01	M. G. B. Rotor Brake Output seal	1.090
-10	Main Rotor Damper Trunnion Assy	3.380	-02	No. 1 Engine Input seal	1.527
-11	M. R. Damper Bearing	3.271	-03	T. R. Takeoff Seal	.327
-12	M. R. Damper Accumulator Assy	.981	-04	Main Gear Box	2.729
-13	Tail G. B. Output Housing Seal	.109	-05	No. 2 Engine Input Seal	.545
-14	Tail Rotor Head Assy	1.090	-06	M. G. B. Oil Pump Assy	.109
-15	T. R. Pitch Change Link	1.308	-07	M. G. B. Chip Detector	.215
-16	T. R. Blade Control Arm	.436	-08	Intermediate Gear Box Output Seal	.436
-17	M. R. Blade Attaching Bolt	.763	-09	Intermediate Gear Box	.215
-18	BIM Indicating Sys.	.327	-10	Tail Gear Box	.109
-19	Main Rotor Blade Assy	.091	-11	Tail Drive Shaft Disc. Assy	.109
-20	Main Rotor Blade Assy	.091	-12	Tail Drive Shaft Bearing Support Assy	2.290
-21	Main Rotor Blade Assy	.091	-13	Tail Drive Shaft Bearing Housing	.109
-22	Main Rotor Blade Assy	.091	-14	APP Clutch	8.941
-23	Main Rotor Blade Assy	.091	-15	APP Clutch Carbon Seal	1.63
-24	Main Rotor Blade Assy	.091	-16	APP Clutch Inboard seal	.109
-25	Main Blade Pocket Assy	.109	-17	Rotor Brake Disc	.545
-26	T. R. Blade Attaching Bolt	.327	-18	Rotor Brake Package	5.019
-27	T. R. Tip Cap Assy	.872	-19	Rotor Brake Press Switch	.763
-28	Tail Blade Assy	1.036	-20	M. G. B. Oil Cooler Bearing	.545
-29	Tail Blade Assy	1.036	-21	M. G. B. Oil Cooler Blower	3.380
-30	Tail Blade Assy	1.036	-22	M. G. B. Oil Cooler V Belt	1.527
-31	Tail Blade Assy	1.036			
-32	Rotors/Blades Catchall	17.663			

CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.
06-23	Trans. Catchall	17.445
07-	POWER PLANT INSTALLATION	(39.04)
-01	N2 Speed Sense Cable Adapter Seal	.327
-02	Anti-Ice Bleed Air Line Jacket Assy	1.199
-03	R. H. Eng. Support Assy	.327
-04	Eng. Exhaust Attachment Bolt	1.199
-05	Anti-Ice Bleed Air Line	.436
-06	Eng. Exhaust Tail Pipe Assy	9.813
-07	Coll. Input Main Fuel Shutoff Control Installation	.436
-08	Coll. Input Fuel Shutoff Control Syncronizer	.763
-09	Coll. Input Fuel Shutoff Control Bellcrank	4.906
-10	Eng. Control Coll. Bias Shear Pin	3.380
-11	N1 Eng. Control Assy	.545
-12	Eng. Speed Control Actuator	4.797
-13	Eng. Hyd. Starter	1.090
-14	Eng. Start Valve	.785
-15	Eng. Hyd. Start Pressure Line	.218
-16	Eng. Mount Inboard Support Bushing	.218
-17	Eng. Mount Deck Fitting Bearing	.109
-18	Eng. Fwd. Strut Assy	.218
-19	EAPS Filter Element	.436
-20	EAPS Blower Unit	.327
-21	EAPS Cover Assy	.218
-22	Power Plant Installation Catchall	7.294
08-	HEATER/ANTI-ICE	(6.11)
-01	Heater Ignitor Unit Assy	.545
-02	Heater Control Assy	.763
-03	Ignitor Plug	1.636
-04	Eng. Anti-Ice Valve	1.417
-05	Heater/Anti-Ice Catchall	1.745

CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.
09-	ELECTRICAL	(27.50)
-01	M. L. G. Isolation Valve Switch	1.527
-02	Pilot's Foot ICS Switch	.981
-03	Chip Detector Cannon Plug	.327
-04	Generator Terminal Board Cover	.109
-05	D. C. Power Reverse Current Relay	.654
-06	APP Ignition Coil	.436
-07	Eng. Start Time Delay Relay	.981
-08	Battery	.872
-09	Fwd. Anti- Collision Beacon Assy	1.854
-10	Aft Position Light	2.944
-11	Aft Anti- Collision Beacon Assy	6.106
-12	Spot Light Control	.545
-13	Fuel Gage Instrument Light	.327
-14	Overhead Dome Light	.109
-15	Dimmer Control Unit	.131
-16	Electrical Catchall	9.595
10-	HYD. FLIGHT CONTROLS	(6.54)
-01	Prim. Servo Center Web Support	.109
-02	Lt. Lat. Primary Servo Cylinder	.109
-03	Rt. Lat. Primary Servo Cylinder	.654
-04	AFCS Coll. Control Open Loop Spring	.545
-05	AFCS Hyd. Servo	1.745
-06	Coll. Control Spring Assy	.545
-07	AFCS Servo Clutch Syncronizer	.763
-08	T. R. Servo Link Assy	.109
-09	Tail Rotor Servo Assy	.109
-10	T. R. Servo Fitting Seal	.109
-11	Hyd. Flt. Control Catchall	1.745
11-	HYDRAULICS	(27.04)
-01	Utility Hyd. Pump	2.508
-02	Utility Pump Seal	.218
-03	Hoist Pump	1.854

TABLE X - CONTINUED

CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.
11-04	Hyd. Solenoid Valve	.545
-05	Flt. Cont. Hydraulic Manifold Tube	.327
-06	Flt. Cont. Hydraulic Manifold Assy	.872
-07	2nd Stage Solenoid Pressure Switch	.763
-08	2nd Stage Servo Pressure Switch	.872
-09	Hoist Well Hyd. Fitting Seal	.218
-10	Hyd. Panel Seal	.218
-11	Cargo Hoist Hyd. Pump	.327
-12	Cargo Hoist Manifold Assy	1.527
-13	Hydraulics Catchall	16.791
12-	FUEL	(9.27)
-01	Eng. Fuel Press. Switch	.981
-02	Fuel Filter Element	1.745
-03	Fuel Boost Pump Pressure Switch	1.854
-04	Fuel Filter Assy	.436
-05	Fuel Catchall	4.252
13-	UTILITIES	(6.65)
-01	Windshield Wiper Assy	.763
-02	Wiper Blade	.109
-03	Windshield Washer Nozzle Assy	.109
-04	APP Fire Detector Bracket	.545
-05	Eng. Fire Detectors	.763
-06	Voice Warning Reproducer Converter	.436
-07	Voice Warning Signal Adapter	.981
-08	Utilities Catchall	2.944
14-	CARGO HANDLING	(9.81)
-01	Load Leveler Accumulator	.218
-02	Load Leveler Actuator	1.199
-03	Cargo Lashing Reel	.527
-04	Cargo Winch Cable Assy	.763
-05	Cargo Hoist Assy	.327
-06	Cargo Cable Guide Liner	1.090
-07	Cargo Winch Decoupler Cylinder	.763
14-08	Cargo Winch Decoupler Assy	.763
-09	Cargo Winch Hook Assy	.436
-10	Load Leveler Grip Assy	.436
-11	Cargo Handling Catchall	3.489
15-	INSTRUMENTS	(41.32)
-01	Tach Generator	2.944
-02	Hoist Indicator	.763
-03	Eng. Press. Ratio Fluid Damper	.545
-04	Fuel Flow Indicator	.545
-05	Directional Gyro	.327
-06	Course Indicator	.109
-07	Radio Magnetic Indicator	.218
-08	J-2 Compass Amplifier	.109
-09	Attitude Indicator	.545
-10	Altimeter	.545
-11	Turn and Slip Indicator	.436
-12	Flight Direction Indicator	.654
-13	Stand By Compass	1.308
-14	Stand By Compass Shock Mounts	.109
-15	Torque Sensor	.436
-16	Altitude Control Cover Assy	1.090
-17	Eng. Speed Switch	.545
-18	FRP Transmitter	.436
-19	Torque Indicator	5.561
-20	Main Trans. Oil Pressure Switch	1.745
-21	IGB Oil Press. Switch	.327
-22	Main Trans. Chip Detectors	.545
-23	OAT Indicator	.327
-24	Hoist Indicator Panel	.763
-25	Caution Panel Assy	.545
-26	Instruments Catchall	19.844
16-	AFCS	(28.13)
-01	Bar Altitude Controller	.981
-02	AFCS Control Panel	3.925

TABLE X - CONTINUED

CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.
16-03	AFCS Control Panel Relay	.545
-04	Stick Trim Amplifier	1.527
-05	AFCS Yaw Control Amplifier	3.816
-06	AFCS Pitch Module	.872
-07	AFCS Roll Module	.654
-08	AFCS Yaw Module	.545
-09	AFCS Pitch Amplifier	.545
-10	Vertical Gyro	.763
-11	Rate Gyro	1.199
-12	Remote Stick Assy	1.963
-13	Remote Stick Resistor	.327
-14	Remote Stick Amplifier	.327
-15	AFCS Catchall	10.140
17-	COMMUNICATIONS	(18.97)
-01	ARC-102 HF Antenna Fwd	.327
-02	ARC-102 HF Antenna Aft	.545
-03	ARC-134 VHF Controller	.327
-04	ARC-134 VHF Rec.-Trans.	2.617
-05	ARC-131 Controller	.218
-06	ARC-131 Rec.-Trans.	2.290
-07	ARC-51 UHF Antenna	.109
-08	ARC-51 UHF Rec.Trans.	2.726
-09	VIC-12 ICS Control	5.670
-10	AIC-12 ICS Radio Switch	.545
-11	ICS Receptacle	.763
-12	APX-72 IFF Control	.218
-13	APX-72 IFF Receiver	.763
-14	Commun. Catchall	1.854
18-	NAVIGATION	(7.74)
-01	ARN-82 VOR Receiver	2.290
-02	ARN-82 VOR Course Indicator	.218

CODE SYS.-ELEM.	NOMENCLATURE	FAIL RATE OVER ALL EVENTS F/1000 Hrs.
18 -03	ARN-33 ADF Receiver	2.617
-04	ARN-33 ADF Audio Trans.	.218
-05	ADF Antenna Inboard	.109
-06	ADF Antenna Outboard	1.308
-07	Nav. Catchall	.981
19-	TURBO SHAFT ENGINE	(38.71)
-01	Oil Strainer Seal	3.816
-02	Eng. Oil Strainer Cover	3.271
-03	Eng. Exhaust Light Gage Duct	.872
-04	Speed Sense Cable	3.489
-05	Eng. Oil Press. Switch	1.636
-06	Eng. Over Speed Monitor Switch	2.617
-07	Eng. Exhaust Heavy Gage Duct	1.199
-08	Eng. No. 1 Fuel Control	.763
-09	Eng. No. 2 Fuel Control	.763
-10	Engine Assy No. 1	2.399
-11	Engine Assy No. 2	2.399
-12	Eng. Anti-Ice Valve	.763
-13	Eng. Trubine Case Assy	2.508
-14	Eng. Fuel Monitoring Installation	1.745
-15	Turbo Eng. Catchall	10.467
20-	AUXILIARY POWER PLANT	(10.36)
-01	APP Control Assy	1.636
-02	90% Speed Switch	1.199
-03	Fuel Pressure Switch Assy	.327
-34	APP Gas Turbine Eng.	.654
-05	APP Input Shaft	.327
-06	Fuel Control	.436
-07	APP Unit	.981
-08	APP Catchall	4.797

APPENDIX II
CH-54B MODEL INPUT FUNCTION DEFINITION

The R&M model input data as organized from the ORME information base is described for the various functions below. These functions relate an independent value in the simulation model to a dependent value, and through these functions, the specific CH-54B aircraft/operation characteristics are introduced into the R&M model. For example, when the daily inspection logic is encountered in a model simulation and the probability of successfully passing the inspection without discovering a failure is required, Function 2, independent value 16, is located and the CH-54B value of .813781 is introduced into the simulation as that probability. This input data described is for the baseline model which has been used in the validation of the CH-54B. Appendix III contains a detailed listing of all CH-54B input functions.

Function 1

An average 1.9-hour single-point winch mission configuration flight was considered.

Function 2

Probability values for successfully passing various ground events without discovering a failure, to be used in the CH-54 baseline simulation, are given as follows:

	Ground Event	Success Probability
1	(Ordance Loading)	.999999
2	(Preflight)	.957697
5	(Aircrew)	.999999
8	(Intermediate Insp.)	.481713
11	(Turnaround Insp.)	.999999
16	(Daily Insp.)	.813781
17	(Periodic Insp.)	.000020
21	(% Good Parts from Supply)	.960000

Events 1, 5, and 11 were, in effect, ignored by entering a probability of success of certainty into the function, since based on observations of Sikorsky ORME reliability engineers, these three ground events do not occur in CH-54B operation. Probability values for events 2, 8, 16 and 17 were based on actual CH-54B failure rate records as reported by the ORME program. The probability value for event 21 is based on discussions with ORME reliability engineers, and its relatively high rate of bad parts from supply is born out by a joint AMRDL/Sikorsky helicopter maintenance effectiveness analysis study.[5]

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[5] Holbert, Calvin, and Newport, Gary, Helicopter Maintenance Effectiveness Analysis, Sikorsky Aircraft, USAAMRDL Technical Report 75-14.

Function 3

The probability of no maintenance action discovered during flight is .737472. This was determined from the ORME Program Quarterly Evaluation Report, SER-64344, Revision K. The "when discovered" summary of the number of maintenance actions of Table II shows 1498 M.A.'s in 9172 flight hours, or a .1633 rate of corrective maintenance actions to flight hours. For a 1.9-hour mission and a .7-hour test flight, the probabilities of sustaining no M.A.'s are

$$P(0) = e^{-.1633 \times 1.9} = .7332 \ \& \ P(0) = e^{-.1633 \times .7} = .8920.$$

Aborted missions reduce the average mission time, resulting in the higher function 3 values.

Function 4

From SER-64344, Revision K, the average flight durations were found to be between .7 and .8 hour for test hops and between 1.8 and 1.9 hours for single-point winch. Because .7 and 1.9 yielded the closest baseline flight hours, they were chosen.

Function 5

From SER-64344, Revision K, the probability of no abort given a M.A. in-flight was found to be .8892. Data from this SER showed 166 aborts in 1498 in-flight failures, or probability of abort equal to

$$\frac{166}{1498} = .1108$$

Therefore, P(no abort) = 1 - .1108 = .8892.

Function 6

This function defines the number of maintenance men, the maintenance work centers, i.e., the maintenance manpower specialty codes, and the elapsed maintenance times, as observed in the ORME preventive maintenance reporting forms to perform the preflight and daily inspections. The function reflects the following information:

Preflight requires two helicopter repairmen for .9 hour.

Daily requires two helicopter repairmen for 2.7 hours.

Function 7

The logic in the R&M model is so constructed as to reverse the priority convention used in the basic GPSS computer language. The priority values referred to in this function are for obtaining manpower to perform the various inspection events. This maintenance priority function, therefore, assigns the lowest priority numbers to the highest priority events. As

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noted in the following assignment of priority numbers, the highest priority event is preflight, followed in order by daily, PMI and PMP inspections. These priorities agree with actual CH-54B operations as observed by Sikorsky ORME reliability engineers.

Function 7 values are:

Event	Priority No.
Preflight	5
Daily	15
PMI	29
PMP	30

Functions 10, 11, 12, 14 and 56

These functions have been revised to simulate CH-54B maintenance frequencies. The functions define the probabilities of multiple maintenance actions (M.A.'s) given that at least one M.A. has occurred. These functions provide the information for during flight, preflight, daily inspection and intermediate inspection, respectively. Since it was not feasible to construct this information from the ORME data base, the functions were derived using the assumption that the probability of a given number of M.A.'s follows a Poisson distribution. In functions 2 and 3, the probabilities of zero M.A.'s are defined for the various events, i.e.:

$$P(0) = e^{-\lambda} \text{ where } \lambda = \text{the frequency of the M.A.}$$

$$\text{the P (at least one M.A.)} = 1-P(0)$$

The Poisson distribution defines the probability of x occurrences by the formula

$$P(x) = \lambda^{x} e^{-\lambda} / x!$$

Therefore, the probability of x M.A.'s given that an M.A. has occurred is provided by the equation

$$P(x)/1-P(0) = (\lambda^{x} e^{-\lambda}/x!)/(1-e^{-\lambda})$$

Specific values for these functions can be observed in Appendix I.

Functions 15 and 23

These are sorting functions which permit the R&M model to sort down from the aircraft to the system and to the component within the system to identify the item causing the M.A. The functions have been revised to account for intermediate inspections. Specifically, these two functions direct the R&M model to other functions which describe the probability that an aircraft M.A. occurs in a given system and then to a second set of functions that describe the probability that a system M.A. occurs in

a given element or component. The description of the two functions as they relate to the various aircraft operational events is contained below.

Event	Event Code	FN15	FN23
Preflight	2	FN19	FN27
Aircrew[6]	5	FN15	FN24
In-flight	6	FN17	FN25
In-flight Abort	7	FN18	FN26
Intermed. Insp.	8	FN57	FN58
Preflight	12	FN19	FN27
Daily	16	FN20	FN28
Periodic Insp.	17	FN21	FN29

Functions 17, 18, 19, 20, 21, and 57

These functions provide the probability of a system's sustaining an M.A. given that the aircraft has sustained an action for the events of in-flight, in-flight abort, preflight, daily, periodic inspection and intermediate inspection. The specific values contained in these functions are shown in Table I under columns headed Cumulative Probability.

Functions 25, 26, 27, 28, 29 and 58

These functions provide the probability of an element or component sustaining an M.A. given that a particular system has sustained an action for the events in-flight, in-flight abort, preflight, daily periodic inspection and intermediate inspection respectively. For the CH-54B, each of these functions contains approximately 300 data entries which describe the most significant components from the viewpoint of frequency of occurrence, expenditures of manpower, and impact on mission success. In order to keep the number of elements reasonable, the least important elements in each system were grouped into a catchall element where cumulative frequency, the average maintenance times, and the most representative maintenance specialists were assigned to these catchall items. These 20 catchall elements accounted for slightly over 30% of all the M.A.'s.

A function 58 was added to this data set since the ORME data included the necessary information. It was not necessary to assume, as was the case in previous Army simulation efforts, that the same distribution of M.A.'s discovered during the more encompassing periodic inspection also applied to the intermediate inspection. The specific values of these functions are seen in Appendix III. These probabilities represent an actual count and the resulting ratio of component maintenance actions within each subsystem as observed within each event.

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[6] Aircrew inspection is covered in these functions because it exists in the R&M model supplied by the Army; however, it will not be activated in the CH-54B simulations since the CH-54B has no comparable event.

Functions 32, 34 and 35

Function 32 defines the probability of a CH-54B aircraft's being not operationally ready (NOR) given a "no abort" in-flight M.A. This function, which prescribes a probability for each aircraft component, was generated from data taken from the ORME Discrepancy/Corrective Action Reports. The probabilities were computed for each element by taking the proportion of in-flight "no abort" M.A.'s that were identified in these ORME reports as having caused the aircraft to be placed in a "downed" status upon completion of the flight.

Functions 34 and 35 reflect, for each CH-54B component, the computed proportion of M.A.'s discovered in preflight and daily inspection, respectively, that down the aircraft. The specific values of these functions are shown in Appendix III.

Functions 37, 40, 42, 43, 53, 54 and 70

These functions describe the on-aircraft and off-aircraft work performed to correct equipment discrepancies (maintenance actions) discovered during the course of equipment operation and inspection. The functions describe the number of maintenance men, their active working time, their specialty codes, and the mean elapsed maintenance time required to perform the corrective action for each component. These are "packed" functions in that their six-digit values convey two or three bits of information rather than the usual one bit of information. Where three bits are addressed, i.e., the six-digit values are in actuality three two-digit values, they are referred to as the A, B and C packs or AP, BP, CP. Where two bits of information are conveyed by the function, the two three-digit values are distinguished by referring to AP and BP. Table XI describes the packed functions as they have been defined to reflect the CH-54B aircraft/operation. Also, the following comments are offered to further describe this information by identifying the sources and limitations of the ORME data used.

    a) The remove and replace data contained in Functions 37, 42, 43 and 70 was derived from ORME Discrepancy/Corrective Action Reports, where the disposition codes were identified as:

- Removed, Repaired, Reinstalled
- Removed, Repaired, Made Ready for Issue (RFI)
- Removed, Scrapped
- Removed, Returned to Depot
- Removed, Tested O.K., Made RFI

These Discrepancy/Corrective Action Reports included all time spent on removing the discrepant part and its replacement either with the same part or with a like item. In the first two cases above, however, some off-aircraft repair time is included. The error introduced by this fact is small since less than 15 percent of all removals observed fall into these two categories.

TABLE XI. ON AND OFF OFF AIRCRAFT MAINTENANCE REQUIREMENTS

#	Function	On Aircraft Repair Data	Remove & Replace Data	Off Aircraft Repair Data	Other Data
	Packs				
37	AP, BP		AP = # M.A.'s Requiring Component Remove & Replace		BP = # Components Repaired Given They Are Received at I.S.
40	AP, BP, CP	BP = Secondary Manpower Work Center CP = Primary Manpower Work Center		AP = Manpower Work Center	
42	AP, BP, CP		BP = Mean number of Men Req. From Secondary Work Center CP = Mean Number of Men Req. From Primary work Center	AP = Mean Number of Men Required	
43	AP, BP		BP = Mean Elapsed Mainten-ance Time For Perfor-ming R&R	AP = Mean Elapsed Mainten-ance Time For Perfor-ming Repair	
53	AP, BP	AP = Mean Elapsed Maintenance Time			BP = 202 Not used in R&M Model
54	AP, BP, CP	BP = Mean Number of Men Req. From Secondary Work Center CP = Mean Number of Men Req. From Primary Work Center			AP = 22 Not used in R&M Model
70	AP, BP, CP		BP = Secondary Manpower Work Center CP = Primary Manpower Work Center		AP = 22 Not used in R&M Model

b) Data for on-aircraft repair functions 40, 53, and 54 was taken from Discrepancy/Corrective Action Reports where the Disposition Code was defined as either "Repaired on Aircraft" or "Checked on Aircraft, Tested O.K."

c) In function 37, BP entries for each component have been set to zero. This was done because the ORME program did not contain data with which to measure the percentage of elements repaired given that they are received at G.S.

d) In functions 40, 42, and 43, the AP values were set to zero since the ORME program did not contain this information.

e) The ORME data shows, in many cases, that more than two maintenance specialties (work centers) were involved in correcting the faults associated with each component. As a result, two things were done. First, since the specialty requirements were somewhat different for remove and replace, as opposed to on-aircraft repair, a separate function, function 70, was created to distinguish between the primary and secondary specialists required for remove and replace vs. those required for on-aircraft repair. Second, where there still remained requirements for more than two maintenance specialties, their times were added to the primary or secondary specialist category that they most closely matched. If no match existed, the times were prorated over the primary and secondary work centers.

Function 44

All CH-54B component elements were reviewed with ORME engineers to define test hop requirements. Based on this work, function 44 has been revised to reflect CH-54B test hop component candidates. Appendix III identifies each component which may require a test hop by associating it with a value one. Appendix IV shows a change in the probability of a maintenance action requirement which was selected in order to bring the test hop flight time to 4.81 percent of the total flight time as was reflected in actual CH-54B operational history.

Function 71

Since function 70 was added to distinguish between work centers required for removal and replacement of a component, as opposed to its repair on-aircraft, an additional function is required to permit sorting the proper digits in the packed function. This function plus its associated variable statements (which also had to be added) are identified below.

    71   Function   P1, E3

           V270   2   V269   3   V268

where V268 = FN70/10,000 for off-equipment W.C.
      V269 = FN70 @ 10,000/100 for secondary W.C., R&R
      V270 = FN70 @ 100 for primary W.C., R&R

APPENDIX III

CH-54B MODEL INPUT FUNCTION LISTING

The following is a listing of all the input function values used in the
CH-54B model. Frequent references to these functions are made in the
main body of the report.

```
           STORAGE      S42,20                                          00002470
           STORAGE      S43-554,899                                     00002471
 *                                                                      00002480
 *                                                                      00002490
 *                                                                      00002500
    1      FUNCTION     P4,D2        RECONFIGURATION SORT               00002510
 C    1         1         1                                            00002520
 *                                                                      00002530
 *                                                                      00002540
    2      FUNCTION     P17,D6       GROUP EVENT PROB OF SUCCESS        00002550
 1    9999992      5576975       9999998    46171311    99999916    81378160002560
 17   00002021      960000                                            00002570
 *                                                                      00002580
 *                                                                      00002590
    3      FUNCTION     P8,D2        PROB NO MA DURING FLIGHT           00002600
 0    8941221      737472                                             00002610
 *                                                                      00002620
 *                                                                      00002630
    4      FUNCTION     P8,D2        MISSION DURATION                   00002640
 C    7         1         15                                           00002650
 *                                                                      00002660
 *                                                                      00002670
    5      FUNCTION     P8,D2        PROB OF NO ABORT/MA IN FLIGHT      00002680
 C    8891061      869166                                             00002690
 *                                                                      00002700
 *                                                                      00002710
    6      FUNCTION     P17,D2       LINE MAINTENANCE MANPOWER,MUS,+DURATION  00002720
 2    20030916      200327                                            00002730
 *                                                                      00002740
 *                                                                      00002750
    7      FUNCTION     P17,D10      MAINTENANCE PRIORITY               00002760
 1    1         2         5         3    28    8    29    11    10    12    5    00002770
 16   15        17        30        22   20    23   25                00002780
 *                                                                      00002790
 *                                                                      00002800
    8      FUNCTION     P17,D2       QUEUE LIMIT GROUND EVENTS          00002810
 1    0         3         999999                                      00002820
 *                                                                      00002830
 *                                                                      00002840
    9      FUNCTION     P19,E9            WHEN DISCOVERED SORT MULTI-FAILURES 00002850
 2    FN11  5    FN13  6    FN10  7    FN10  8    FN56  12   FN11      00002860
 16   FN12  17   FN14  21   FN51                                      00002870
 *                                                                      00002880
 *                                                                      00002890
   10      FUNCTION     RN1,D4       PROB MULT MA/MA DURING FLIGHT      00002900
 0.86571      0.98702      0.99913      0.99994                        00002910
 *                                                                      00002920
 *                                                                      00002930
   11      FUNCTION     RN1,D3       PROB MULT MA/MA DURING PREFLIGHT   00002940
 0.97851      0.99972      0.99993                                     00002950
 *                                                                      00002960
 *                                                                      00002970
   12      FUNCTION     RN1,D4       PROB MULT MA/MA DURING DAILY       00002980
 0.90051      0.99332      0.99973      0.99994                        00002990
 *                                                                      00003000
 *                                                                      00003010
   13      FUNCTION     RN1,D2       PROB MULT MA/MA DURING AIRCREW     00003020
 0.99101      0.99992                                                  00003030
 *                                                                      00003040
 *                                                                      00003050
   14      FUNCTION     RN1,D25      PROB MULT MA/MA PMP                00003060
 0.00021      0.00142   0.00563   0.01694   0.04145   0.08576          00003070
 0.15437      0.24718   0.35859   0.48001   0.599211  0.706812         00003080
 0.796513     0.865914  0.916015  0.950016  0.971617  0.984618         00003090
 0.992019     0.996120  0.998121  0.999122  0.999623  0.999824         00003100
 0.999925                                                              00003110
```

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```
 *                                                                              00003120
 *                                                                              00003130
 15    FUNCTION   P19,L8      WHEN DISCOVERED SORT SYSTEM FAILURE               00003140
 2     FN19   5    FN16   6     FN17  7      FN18  8      FN57  12      FN19     00003150
 16    FN20   17   FN21                                                         00003160
 *                                                                              00003170
 *                                                                              00003180
 16    FUNCTION   RN1,U21     PROB SYSTEM MA AIRCREW/MA AIRCREW                 00003190
 0.180201       0.189202      0.207203      0.252304      0.342305     0.531506 00003200
 0.617107       0.716208      0.725209      0.842310      0.878411     0.891912 00003210
 0.905413       0.914414      0.936915      0.955019      0.959520     0.968522 00003220
 0.973023       0.977524      0.999925                                          00003230
 *                                                                              00003240
 *                                                                              00003250
 17    FUNCTION   RN1,U20     PROB SYSTEM MA IN-FLIGHT/MA IN-FLIGHT             00003260
 0.008701       0.030702      0.042703      0.076104      0.089505     0.171606 00003270
 0.251007       0.275008      0.333009      0.357710      0.415711     0.443712 00003280
 0.465713       0.483714      0.641915      0.786816      0.874317     0.915718 00003290
 0.973119       0.999920                                                        00003300
 *                                                                              00003310
 *                                                                              00003320
 18    FUNCTION   RN1,U15     PROB SYSTEM MA ABORT IN-FLT/MA ABT IN-FLT         00003330
 0.021001       0.027602      0.105304      0.147505      0.286106     0.406607 00003340
 0.557211       0.587312      0.629513      0.665614      0.743915     0.810216 00003350
 0.816217       0.954819      0.999920                                          00003360
 *                                                                              00003370
 *                                                                              00003380
 19    FUNCTION   RN1,U20     PROB SYSTEM MA PREFLIGHT/MA PREFLIGHT             00003390
 0.082401       0.139202      0.193603      0.357404      0.372705     0.500606 00003400
 0.543207       0.572308      0.682309      0.686610      0.774711     0.793912 00003410
 0.806113       0.851614      0.912915      0.946316      0.958417     0.960218 00003420
 0.981219       0.999920                                                        00003430
 *                                                                              00003440
 *                                                                              00003450
 20    FUNCTION   RN1,U20     PROB SYSTEM MA DAILY/MA DAILY                     00003460
 0.045301       0.102702      0.119503      0.225604      0.279005     0.418906 00003470
 0.550807       0.557408      0.638209      0.645710      0.730811     0.733412 00003480
 0.745113       0.776014      0.811515      0.822316      0.836817     0.841918 00003490
 0.973219       0.999920                                                        00003500
 *                                                                              00003510
 *                                                                              00003520
 21    FUNCTION   RN1,U20     PROB SYSTEM MA PMP/MA PMP                         00003530
 0.120101       0.235002      0.254903      0.435604      0.471305     0.577906 00003540
 0.648107       0.652108      0.685309      0.698610      0.736411     0.760212 00003550
 0.770813       0.782314      0.858715      0.884916      0.897517     0.899818 00003560
 0.985119       0.999920                                                        00003570
 *                                                                              00003580
 *                                                                              00003590
 22    FUNCTION   P3,L20      NUMBER OF ELEMENTS IN SYSTEMS                     00003600
 01    20    02    24    03    13    04    32    05    8    06    23             00003610
 07    22    08    5     09    16    10    11    11    13   12    5              00003620
 13    8     14    11    15    26    16    15    17    14   18    7              00003630
 19    15    20    6                                                            00003640
 *                                                                              00003650
 *                                                                              00003660
 23    FUNCTION   P19,L8      WHEN DISCOVERED SORT ELEMENT FAILURE              00003670
 2     FN27   5    FN24   6     FN25  7      FN26  8      FN58  12      FN27     00003680
 16    FN28   17   FN29                                                         00003690
 *                                                                              00003700
 *                                                                              00003710
 24    FUNCTION   FN46,L241   PROB ELEMENT MA AIRCREW/MA SYS AIRCREW            00003720
 0101  025   0102  000   0103  050   0104  025   0105  050   0106  150          00003730
 0107  125   0108  050   0109  050   0110  075   0111  100   0112  000          00003740
 0113  075   0114  100   0115  075   0116  050   0201  000   0202  999          00003750
 0203  000   0204  000   0205  000   0301  250   0302  250   0303  250          00003760
 0304  250   0305  000   0401  000   0402  200   0403  000   0404  000   0405770.
```

0405	000	0406	000	0407	000	0408	000	0409	000	0410	000	00003780
0411	100	0412	000	0413	000	0414	000	0415	200	0416	200	00003790
0417	000	0418	100	0419	100	0420	000	0421	100	0422	000	00003800
0423	000	0424	000	0425	000	0501	200	0502	100	0503	000	00003810
0504	000	0505	000	0506	150	0507	250	0508	000	0509	000	00003820
0510	250	0511	000	0512	000	0513	050	0514	000	0515	000	00003830
0516	000	0517	000	0601	000	0602	000	0603	000	0604	000	00003840
0605	071	0606	095	0607	214	0608	048	0609	000	0610	000	00003850
0611	143	0612	048	0613	214	0614	071	0615	000	0616	071	00003860
0617	000	0618	024	0701	105	0702	000	0703	053	0704	105	00003870
0705	000	0706	000	0707	000	0708	158	0709	000	0710	000	00003880
0711	000	0712	053	0713	053	0714	053	0715	053	0716	105	00003890
0717	053	0718	053	0719	053	0720	000	0721	000	0722	000	00003900
0723	000	0724	105	0725	000	0801	000	0802	091	0803	136	00003910
0804	000	0805	000	0806	091	0807	000	0808	091	0809	000	00003920
0810	000	0811	045	0812	273	0813	000	0814	000	0815	045	00003930
0816	045	0817	045	0818	136	0819	000	0820	000	0821	000	00003940
0901	500	0902	000	0903	000	0904	500	0905	000	0906	000	00003950
0907	000	0908	000	1001	077	1002	038	1003	000	1004	192	00003960
1005	192	1006	231	1007	038	1008	077	1009	077	1010	000	00003970
1011	000	1012	000	1013	000	1014	038	1015	000	1016	038	00003980
1017	000	1018	000	1019	000	1101	375	1102	000	1103	125	00003990
1104	000	1105	000	1106	000	1107	125	1108	000	1109	375	00004000
1110	000	1201	000	1202	333	1203	000	1204	000	1205	000	00004010
1206	000	1207	667	1208	000	1209	000	1301	000	1302	333	00004020
1303	333	1304	000	1305	333	1401	000	1402	500	1403	000	00004030
1404	500	1405	000	1406	000	1407	000	1408	000	1409	000	00004040
1410	000	1411	000	1501	200	1502	000	1503	000	1504	200	00004050
1505	000	1506	000	1507	000	1508	000	1509	200	1510	200	00004060
1511	000	1512	200	1513	000	1514	000	1515	000	1516	000	00004070
1517	000	1518	000	1519	000	1520	000	1521	000	1522	000	00004080
1601	000	1602	000	1603	000	1701	000	1702	000	1703	000	00004090
1801	000	1802	000	1803	000	1901	000	1902	000	1903	000	00004100
1904	000	1905	750	1906	250	2001	000	2002	000	2003	999	00004110
2101	000	2201	999	2202	000	2203	000	2301	999	2401	999	00004120
2501	999											00004130
*												00004140
*												00004150

25	FUNCTION		FN46,L296		PROB	ELEMENT	MA	IN-FLIGHT/SYS	MA	IN-FLIGHT		00004160
0101	000	0102	077	0103	077	0104	000	0105	000	0106	000	00004170
0107	000	0108	000	0109	000	0110	000	0111	000	0112	000	00004180
0113	000	0114	000	0115	000	0116	000	0117	000	0118	000	00004190
0119	000	0120	846	0201	030	0202	030	0203	061	0204	030	00004200
0205	000	0206	000	0207	000	0208	000	0209	000	0210	000	00004210
0211	000	0212	303	0213	000	0214	000	0215	000	0216	091	00004220
0217	061	0218	030	0219	000	0220	000	0221	000	0222	000	00004230
0223	091	0224	273	0301	000	0302	055	0303	000	0304	333	00004240
0305	000	0306	000	0307	000	0308	000	0309	000	0310	000	00004250
0311	000	0312	000	0313	611	0401	080	0402	000	0403	000	00004260
0404	020	0405	000	0406	020	0407	000	0408	000	0409	000	00004270
0410	020	0411	120	0412	000	0413	000	0414	020	0415	000	00004280
0416	000	0417	000	0418	000	0419	004	0420	004	0421	004	00004290
0422	004	0423	004	0424	004	0425	000	0426	000	0427	000	00004300
0428	000	0429	000	0430	000	0431	000	0432	640	0501	000	00004310
0502	050	0503	850	0504	100	0505	000	0506	000	0507	000	00004320
0508	000	0601	000	0602	000	0603	008	0604	106	0605	000	00004330
0606	000	0607	000	0608	000	0609	008	0610	000	0611	000	00004340
0612	008	0613	008	0614	228	0615	000	0616	000	0617	008	00004350
0618	211	0619	057	0620	000	0621	008	0622	024	0623	317	00004360
0701	008	0702	017	0703	000	0704	000	0705	000	0706	017	00004370
0707	025	0708	042	0709	218	0710	185	0711	034	0712	218	00004380
0713	008	0714	034	0715	017	0716	000	0717	000	0718	000	00004390
0719	000	0720	017	0721	000	0722	160	0801	083	0802	167	00004400
0803	333	0804	167	0805	250	0901	103	0902	034	0903	000	00004410
0904	000	0905	034	0906	011	0907	040	0908	011	0909	069	00004420
0910	092	0911	230	0912	023	0913	023	0914	011	0915	000	00004430

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0916 310   1001 000   1002 000   1003 054   1004 135   1005 351   00004440
1006 108   1007 162   1008 000   1009 000   1010 000   1011 189   00004450
1101 103   1102 000   1103 103   1104 011   1105 011   1106 034   00004460
1107 034   1108 069   1109 000   1110 000   1111 011   1112 034   00004470
1113 586   1201 071   1202 333   1203 238   1204 048   1205 310   00004480
1301 030   1302 000   1303 030   1304 000   1305 182   1306 061   00004490
1307 242   1308 455   1401 000   1402 074   1403 037   1404 111   00004500
1405 037   1406 000   1407 037   1408 148   1409 074   1410 000   00004510
1411 481   1501 080   1502 021   1503 017   1504 013   1505 013   00004520
1506 004   1507 008   1508 004   1509 013   1510 008   1511 017   00004530
1512 017   1513 017   1514 000   1515 008   1516 000   1517 004   00004540
1518 013   1519 198   1520 051   1521 008   1522 013   1523 008   00004550
1524 025   1525 013   1526 426   1601 043   1602 144   1603 019   00004560
1604 058   1605 154   1606 034   1607 029   1608 024   1609 019   00004570
1610 029   1611 043   1612 067   1613 010   1614 014   1615 313   00004580
1701 007   1702 000   1703 021   1704 157   1705 014   1706 129   00004590
1707 000   1708 157   1709 329   1710 029   1711 043   1712 014   00004600
1713 050   1714 050   1801 339   1802 032   1803 387   1804 000   00004610
1805 016   1806 081   1807 145   1901 035   1902 058   1903 000   00004620
1904 012   1905 093   1906 198   1907 000   1908 041   1909 041   00004630
1910 081   1911 081   1912 023   1913 000   1914 128   1915 209   00004640
2001 075   2002 200   2003 075   2004 100   2005 050   2006 075   00004650
2007 100   2008 325                                               00004660
  26    FUNCTION    FN46,L296   PROB ELEMENT MA INFLT ABT/SYS MA INFLT ABT 00004670
0101 000   0102 000   0103 000   0104 000   0105 000   0106 000   00004680
0107 000   0108 000   0109 000   0110 000   0111 000   0112 000   00004690
0113 000   0114 000   0115 000   0116 000   0117 000   0118 000   00004700
0119 000   0120 999   0201 000   0202 000   0203 000   0204 000   00004710
0205 000   0206 000   0207 000   0208 000   0209 000   0210 000   00004720
0211 000   0212 000   0213 000   0214 000   0215 000   0216 999   00004730
0217 000   0218 000   0219 000   0220 000   0221 000   0222 000   00004740
0223 000   0224 000   0301 000   0302 000   0303 000   0304 000   00004750
0305 000   0306 000   0307 000   0308 000   0309 000   0310 000   00004760
0311 000   0312 000   0313 000   0401 077   0402 000   0403 000   00004770
0404 154   0405 000   0406 000   0407 000   0408 077   0409 000   00004780
0410 000   0411 000   0412 000   0413 000   0414 077   0415 000   00004790
0416 000   0417 000   0418 000   0419 013   0420 013   0421 013   00004800
0422 013   0423 013   0424 013   0425 077   0426 000   0427 000   00004810
0428 000   0429 000   0430 000   0431 000   0432 462   0501 000   00004820
0502 286   0503 571   0504 000   0505 000   0506 000   0507 000   00004830
0508 143   0601 000   0602 000   0603 000   0604 174   0605 000   00004840
0606 000   0607 043   0608 000   0609 043   0610 000   0611 043   00004850
0612 000   0613 000   0614 261   0615 000   0616 000   0617 000   00004860
0618 043   0619 000   0620 000   0621 000   0622 087   0623 304   00004870
0701 000   0702 050   0703 000   0704 000   0705 000   0706 000   00004880
0707 000   0708 100   0709 300   0710 200   0711 050   0712 100   00004890
0713 000   0714 050   0715 000   0716 000   0717 000   0718 000   00004900
0719 000   0720 000   0721 000   0722 150   0801 000   0802 000   00004910
0803 000   0804 000   0805 000   0901 000   0902 000   0903 000   00004920
0904 000   0905 000   0906 000   0907 000   0908 000   0909 000   00004930
0910 000   0911 000   0912 000   0913 000   0914 000   0915 000   00004940
0916 000   1001 000   1002 000   1003 000   1004 000   1005 000   00004950
1006 000   1007 000   1008 000   1009 000   1010 000   1011 000   00004960
1101 160   1102 000   1103 000   1104 000   1105 000   1106 080   00004970
1107 000   1108 080   1109 000   1110 000   1111 000   1112 120   00004980
1113 560   1201 200   1202 000   1203 000   1204 000   1205 800   00004990
1301 000   1302 000   1303 000   1304 000   1305 429   1306 000   00005000
1307 000   1308 571   1401 000   1402 000   1403 000   1404 000   00005010
1405 167   1406 000   1407 167   1408 500   1409 000   1410 000   00005020
1411 167   1501 308   1502 000   1503 000   1504 000   1505 000   00005030
1506 000   1507 000   1508 000   1509 000   1510 000   1511 000   00005040
1512 000   1513 000   1514 000   1515 077   1516 000   1517 077   00005050
1518 000   1519 077   1520 154   1521 077   1522 077   1523 000   00005060
1524 000   1525 000   1526 154   1601 000   1602 091   1603 182   00005070
1604 000   1605 091   1606 000   1607 091   1608 000   1609 000   00005080
1610 000   1611 000   1612 091   1613 000   1614 000   1615 455   00005090
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61

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1707  000  1708  000  1709  000  1710  000  1711  000  1712  000  00005110
1713  000  1714  999  1801  000  1802  000  1803  000  1804  000  00005120
1805  000  1806  000  1807  000  1901  000  1902  043  1903  000  00005130
1904  000  1905  000  1906  000  1907  000  1908  043  1909  043  00005140
1910  087  1911  087  1912  000  1913  000  1914  304  1915  000  00005150
2001  111  2002  333  2003  000  2004  111  2005  000  2006  000  00005160
2007  000  2008  444                                               00005170
 27   FUNCTION    FN40,L296   PROB ELEMENT MA PREFLIGHT/SYS MA PREFLIGHT00005180
0101  056  0102  000  0103  056  0104  000  0105  000  0106  000  00005190
0107  000  0108  000  0109  000  0110  000  0111  000  0112  022  00005200
0113  000  0114  000  0115  000  0116  000  0117  000  0118  000  00005210
0119  022  0120  019  0201  000  0202  000  0203  000  0204  050  00005220
0205  000  0206  000  0207  000  0208  000  0209  000  0210  000  00005230
0211  100  0212  125  0213  000  0214  069  0215  000  0216  100  00005240
0217  000  0218  000  0219  094  0220  000  0221  000  0222  000  00005250
0223  003  0224  400  0301  065  0302  000  0303  000  0304  000  00005260
0305  033  0306  201  0307  033  0308  000  0309  000  0310  000  00005270
0311  000  0312  052  0313  556  0401  076  0402  087  0403  022  00005280
0404  003  0405  028  0406  000  0407  000  0408  152  0409  043  00005290
0410  000  0411  000  0412  000  0413  022  0414  098  0415  022  00005300
0416  000  0417  000  0418  000  0419  000  0420  000  0421  000  00005310
0422  000  0423  000  0424  000  0425  000  0426  000  0427  000  00005320
0428  019  0429  019  0430  019  0431  019  0432  289  0501  000  00005330
0502  465  0503  000  0504  000  0505  000  0506  000  0507  000  00005340
0508  535  0601  000  0602  000  0603  000  0604  000  0605  000  00005350
0606  000  0607  000  0608  000  0609  000  0610  000  0611  028  00005360
0612  069  0613  000  0614  061  0615  000  0616  006  0617  000  00005370
0618  000  0619  000  0620  000  0621  031  0622  197  0623  608  00005380
0701  000  0702  000  0703  000  0704  000  0705  083  0706  183  00005390
0707  017  0708  000  0709  000  0710  000  0711  000  0712  000  00005400
0713  150  0714  067  0715  000  0716  000  0717  016  0718  000  00005410
0719  083  0720  016  0721  000  0722  383  0801  061  0802  000  00005420
0803  366  0804  573  0805  000  0901  000  0902  000  0903  000  00005430
0904  000  0905  000  0906  000  0907  000  0908  000  0909  282  00005440
0910  051  0911  186  0912  000  0913  000  0914  000  0915  010  00005450
0916  465  1001  000  1002  853  1003  000  1004  000  1005  000  00005460
1006  000  1007  167  1008  000  1009  000  1010  000  1011  000  00005470
1101  113  1102  000  1103  161  1104  121  1105  000  1106  000  00005480
1107  000  1108  000  1109  000  1110  061  1111  000  1112  000  00005490
1113  524  1201  000  1202  000  1203  426  1204  093  1205  481  00005500
1301  000  1302  000  1303  000  1304  000  1305  050  1306  000  00005510
1307  050  1308  900  1401  041  1402  146  1403  163  1404  000  00005520
1405  041  1406  000  1407  244  1408  000  1409  041  1410  325  00005530
1411  000  1501  157  1502  000  1503  012  1504  000  1505  000  00005540
1506  000  1507  000  1508  000  1509  000  1510  000  1511  000  00005550
1512  000  1513  000  1514  000  1515  029  1516  000  1517  000  00005560
1518  012  1519  000  1520  000  1521  012  1522  029  1523  058  00005570
1524  000  1525  116  1526  576  1601  000  1602  160  1603  000  00005580
1604  053  1605  000  1606  021  1607  000  1608  000  1609  021  00005590
1610  021  1611  000  1612  000  1613  021  1614  000  1615  702  00005600
1701  000  1702  000  1703  000  1704  000  1705  000  1706  000  00005610
1707  000  1708  882  1709  000  1710  059  1711  059  1712  000  00005620
1713  000  1714  000  1801  000  1802  000  1803  000  1804  999  00005630
1805  000  1806  000  1807  000  1901  203  1902  000  1903  000  00005640
1904  000  1905  000  1906  000  1907  000  1908  000  1909  000  00005650
1910  000  1911  000  1912  000  1913  000  1914  000  1915  707  00005660
2001  588  2002  137  2003  000  2004  000  2005  000  2006  039  00005670
2007  235  2008  000                                               00005680
 28   FUNCTION    FN46,L296   PROB ELEMENT MA    DAILY   /SYS MA DAILY   00005690
0101  102  0102  000  0103  000  0104  080  0105  000  0106  000  00005700
0107  000  0108  000  0109  167  0110  046  0111  000  0112  010  00005710
0113  006  0114  006  0115  006  0116  000  0117  000  0118  000  00005720
0119  010  0120  568  0201  000  0202  000  0203  000  0204  013  00005730
0205  000  0206  000  0207  016  0208  000  0209  000  0210  000  00005740
0211  025  0212  094  0213  000  0214  124  0215  000  0216  122  00005750
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0217	077	0218	000	0219	214	0220	000	0221	000	0222	016	00005760
0223	016	0224	477	0301	108	0302	000	0303	000	0304	000	00005770
0305	027	0306	000	0307	000	0308	000	0309	000	0310	000	00005780
0311	000	0312	043	0313	823	0401	030	0402	000	0403	007	00005790
0404	068	0405	009	0406	000	0407	170	0408	000	0409	046	00005800
0410	076	0411	044	0412	037	0413	000	0414	023	0415	007	00005810
0416	000	0417	000	0418	010	0419	000	0420	000	0421	000	00005820
0422	000	0423	000	0424	000	0425	000	0426	000	0427	044	00005830
0428	015	0429	015	0430	015	0431	015	0432	372	0501	000	00005840
0502	077	0503	212	0504	000	0505	000	0506	062	0507	243	00005850
0508	405	0601	036	0602	075	0603	006	0604	039	0605	032	00005860
0606	000	0607	013	0608	006	0609	000	0610	000	0611	000	00005870
0612	056	0613	000	0614	209	0615	006	0616	002	0617	026	00005880
0618	077	0619	000	0620	000	0621	050	0622	008	0623	357	00005890
0701	014	0702	031	0703	007	0704	068	0705	021	0706	495	00005900
0707	002	0708	007	0709	033	0710	041	0711	007	0712	031	00005910
0713	037	0714	005	0715	000	0716	000	0717	002	0718	000	00005920
0719	014	0720	002	0721	014	0722	171	0801	068	0802	137	00005930
0803	000	0804	315	0805	479	0901	000	0902	033	0903	017	00005940
0904	003	0905	033	0906	000	0907	000	0908	047	0909	025	00005950
0910	158	0911	241	0912	033	0913	011	0914	000	0915	003	00005960
0916	394	1001	000	1002	000	1003	000	1004	000	1005	000	00005970
1006	120	1007	036	1008	000	1009	120	1010	000	1011	723	00005980
1101	059	1102	021	1103	000	1104	011	1105	000	1106	040	00005990
1107	029	1108	011	1109	000	1110	000	1111	021	1112	117	00006000
1113	692	1201	000	1202	000	1203	828	1204	172	1205	000	00006010
1301	306	1302	000	1303	000	1304	308	1305	023	1306	154	00006020
1307	023	1308	185	1401	014	1402	148	1403	000	1404	036	00006030
1405	014	1406	173	1407	082	1408	000	1409	014	1410	000	00006040
1411	521	1501	000	1502	027	1503	008	1504	000	1505	000	00006050
1506	000	1507	000	1508	000	1509	053	1510	027	1511	000	00006060
1512	053	1513	000	1514	000	1515	013	1516	027	1517	053	00006070
1518	006	1519	000	1520	000	1521	008	1522	013	1523	000	00006080
1524	027	1525	000	1526	684	1601	000	1602	130	1603	000	00006090
1604	043	1605	000	1606	026	1607	000	1608	000	1609	026	00006100
1610	026	1611	000	1612	348	1613	026	1614	000	1615	374	00006110
1701	000	1702	248	1703	000	1704	000	1705	000	1706	000	00006120
1707	000	1708	000	1709	280	1710	019	1711	019	1712	000	00006130
1713	000	1714	435	1801	000	1802	000	1803	000	1804	088	00006140
1805	000	1806	912	1807	000	1901	180	1902	103	1903	021	00006150
1904	000	1905	048	1906	024	1907	041	1908	000	1909	000	00006160
1910	062	1911	062	1912	034	1913	146	1914	023	1915	257	00006170
2001	101	2002	027	2003	000	2004	034	2005	000	2006	010	00006180
2007	044	2008	785									00006190
29	FUNCTION	FN46,L296		PROD ELEMENT MA		P M P		/SYS MA	P M P			00006200
0101	022	0102	017	0103	056	0104	000	0105	017	0106	017	00006210
0107	017	0108	050	0109	070	0110	095	0111	025	0112	004	00006220
0113	002	0114	002	0115	002	0116	008	0117	017	0118	025	00006230
0119	004	0120	551	0201	000	0202	017	0203	000	0204	007	00006240
0205	000	0206	026	0207	017	0208	009	0209	035	0210	000	00006250
0211	028	0212	017	0213	035	0214	078	0215	043	0216	014	00006260
0217	245	0218	035	0219	013	0220	013	0221	000	0222	026	00006270
0223	009	0224	333	0301	000	0302	000	0303	100	0304	050	00006280
0305	025	0306	000	0307	025	0308	100	0309	050	0310	100	00006290
0311	000	0312	040	0313	510	0401	025	0402	000	0403	011	00006300
0404	033	0405	040	0406	028	0407	118	0408	007	0409	006	00006310
0410	077	0411	095	0412	019	0413	030	0414	006	0415	039	00006320
0416	022	0417	039	0418	008	0419	000	0420	000	0421	000	00006330
0422	000	0423	000	0424	000	0425	006	0426	017	0427	007	00006340
0428	032	0429	032	0430	032	0431	032	0432	269	0501	084	00006350
0502	056	0503	154	0504	000	0505	056	0506	263	0507	355	00006360
0508	034	0601	021	0602	021	0603	009	0604	037	0605	000	00006370
0606	000	0607	000	0608	028	0609	049	0610	009	0611	000	00006380
0612	070	0613	000	0614	181	0615	000	0616	003	0617	000	00006390
0618	075	0619	000	0620	035	0621	117	0622	012	0623	312	00006400
0701	000	0702	005	0703	028	0704	000	0705	000	0706	142	00006410

0707	004	0708	014	0709	201	0710	043	0711	000	0712	128	00006420
0713	026	0714	011	0715	000	0716	028	0717	004	0718	028	00006430
0719	014	0720	004	0721	000	0722	260	0801	125	0802	000	00006440
0803	000	0804	000	0805	875	0901	150	0902	090	0903	045	00006450
0904	009	0905	000	0906	090	0907	150	0908	084	0909	000	00006460
0910	048	0911	084	0912	000	0913	000	0914	000	0915	009	00006470
0916	240	1001	075	1002	000	1003	301	1004	000	1005	226	00006480
1006	000	1007	023	1008	075	1009	000	1010	075	1011	226	00006490
1101	148	1102	000	1103	106	1104	000	1105	053	1106	032	00006500
1107	034	1108	000	1109	053	1110	000	1111	000	1112	000	00006510
1113	575	1201	000	1202	000	1203	000	1204	021	1205	979	00006520
1301	187	1302	094	1303	000	1304	094	1305	028	1306	000	00006530
1307	028	1308	566	1401	043	1402	157	1403	000	1404	235	00006540
1405	043	1406	217	1407	000	1408	261	1409	043	1410	000	00006550
1411	000	1501	069	1502	013	1503	004	1504	013	1505	000	00006560
1506	000	1507	000	1508	000	1509	000	1510	013	1511	000	00006570
1512	000	1513	104	1514	013	1515	007	1516	104	1517	026	00006580
1518	004	1519	052	1520	052	1521	004	1522	007	1523	000	00006590
1524	000	1525	000	1526	515	1601	000	1602	057	1603	038	00006600
1604	019	1605	114	1606	011	1607	000	1608	000	1609	011	00006610
1610	011	1611	076	1612	000	1613	011	1614	000	1615	650	00006620
1701	159	1702	079	1703	000	1704	159	1705	000	1706	238	00006630
1707	079	1708	000	1709	119	1710	024	1711	024	1712	000	00006640
1713	000	1714	119	1801	000	1802	000	1803	000	1804	217	00006650
1805	000	1806	783	1807	000	1901	014	1902	043	1903	058	00006660
1904	242	1905	000	1906	041	1907	047	1908	041	1909	041	00006670
1910	061	1911	061	1912	000	1913	021	1914	020	1915	310	00006680
2001	149	2002	053	2003	000	2004	066	2005	066	2006	020	00006690
2007	086	2008	510									00006700
30		FUNCTION		FN46,L241		PROB	ARCRW	GRD	ABORT/MA	DURING	AIRCREW	00006710
0101	000	0102	000	0103	000	0104	000	0105	000	0106	000	00006720
0107	000	0108	500	0109	000	0110	000	0111	000	0112	000	00006730
0113	000	0114	000	0115	333	0116	000	0201	000	0202	999	00006740
0203	000	0204	000	0205	000	0301	000	0302	000	0303	000	00006750
0304	000	0305	000	0401	000	0402	500	0403	000	0404	000	00006760
0405	000	0406	000	0407	000	0408	000	0409	000	0410	000	00006770
0411	000	0412	000	0413	000	0414	000	0415	500	0416	000	00006780
0417	000	0418	000	0419	000	0420	000	0421	000	0422	000	00006790
0423	000	0424	000	0425	000	0501	000	0502	000	0503	000	00006800
0504	000	0505	000	0506	333	0507	400	0508	000	0509	000	00006810
0510	000	0511	000	0512	000	0513	000	0514	000	0515	000	00006820
0516	000	0517	000	0601	000	0602	000	0603	000	0604	000	00006830
0605	000	0606	250	0607	222	0608	500	0609	000	0610	000	00006840
0611	500	0612	000	0613	000	0614	667	0615	000	0616	667	00006850
0617	000	0618	999	0701	000	0702	000	0703	000	0704	500	00006860
0705	000	0706	000	0707	000	0708	000	0709	000	0710	000	00006870
0711	000	0712	000	0713	000	0714	000	0715	000	0716	000	00006880
0717	000	0718	000	0719	999	0720	000	0721	000	0722	000	00006890
0723	000	0724	500	0725	000	0801	000	0802	500	0803	000	00006900
0804	000	0805	000	0806	500	0807	000	0808	000	0809	000	00006910
0810	000	0811	000	0812	500	0813	000	0814	000	0815	000	00006920
0816	999	0817	999	0818	000	0819	000	0820	000	0821	000	00006930
0901	000	0902	000	0903	000	0904	000	0905	000	0906	000	00006940
0907	000	0908	000	1001	999	1002	000	1003	000	1004	999	00006950
1005	200	1006	633	1007	999	1008	999	1009	500	1010	000	00006960
1011	000	1012	000	1013	000	1014	999	1015	000	1016	000	00006970
1017	000	1018	000	1019	000	1101	999	1102	000	1103	999	00006980
1104	000	1105	000	1106	000	1107	999	1108	000	1109	000	00006990
1110	000	1201	000	1202	999	1203	000	1204	000	1205	000	00007000
1206	000	1207	999	1208	000	1209	000	1301	000	1302	999	00007010
1303	999	1304	000	1305	000	1401	000	1402	000	1403	000	00007020
1404	999	1405	000	1406	000	1407	000	1408	000	1409	000	00007030
1410	000	1411	000	1501	000	1502	000	1503	000	1504	999	00007040
1505	000	1506	000	1507	000	1508	000	1509	000	1510	000	00007050
1511	000	1512	000	1513	000	1514	000	1515	000	1516	000	00007060
1517	000	1518	000	1519	000	1520	000	1521	000	1522	000	00007070

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1601  000   1602  000   1603  000   1701  000   1702  000   1703  000   00007080
1801  000   1802  000   1803  000   1901  000   1902  000   1903  000   00007090
1904  000   1905  999   1906  999   2001  000   2002  000   2003  999   00007100
2101  000   2201  500   2202  000   2203  000   2301  000   2401  999   00007110
2501  000                                                               00007120
*                                                                       00007130
*                                                                       00007140
 31    FUNCTION   P19,E4            PROB OF NORM SORT                    00007150
 2     FN34  5    FN33  6    FN32  16    FN35                            00007160
*                                                                       00007170
*                                                                       00007180
 32    FUNCTION   FN46,L296      PROB NOR/MA IN-FLIGHT NO ABORT          00007190
0101 0000000102 0000000103 0000000104 0000000105 0000000106 00000000007200
0107 0000000108 0000000109 0000000110 0000000111 0000000112 00000000007210
0113 0000000114 0000000115 0000000116 0000000117 0000000118 00000000007220
0119 0000000120 1111110201 0000000202 0000000203 0000000204 00000000007230
0205 0000000206 0000000207 0000000208 0000000209 0000000210 00000000007240
0211 0000000212 0000000213 0000000214 0000000215 0000000216 99999900007250
0217 9999990218 0000000219 0000000220 0000000221 0000000222 00000000007260
0223 0000000224 2222220301 0000000302 0000000303 0000000304 00000000007270
0305 0000000306 0000000307 0000000308 0000000309 0000000310 00000000007280
0311 0000000312 0000000313 0000000401 3333330402 0000000403 00000000007290
0404 0000000405 0000000406 0000000407 0000000408 0000000409 00000000007300
0410 9999990411 0000000412 0000000413 0000000414 0000000415 00000000007310
0416 0000000417 0000000418 0000000419 0000000420 0000000421 00000000007320
0422 0000000423 0000000424 0000000425 0000000426 0000000427 00000000007330
0428 0000000429 0000000430 0000000431 0000000432 1923080501 00000000007340
0502 0000000503 4615380504 0000000505 0000000506 0000000507 00000000007350
0508 0000000601 0000000602 0000000603 9999990604 8888880605 00000000007360
0606 9999990607 0000000608 0000000609 0000000610 0000000611 00000000007370
0612 0000000613 9999990614 2727270615 0000000616 0000000617 00000000007380
0618 0000000619 1428570620 0000000621 9999990622 0000000623 12500000007390
0701 9999990702 0000000703 0000000704 0000000705 0000000706 50000000007400
0707 3333330708 3333330709 2000000710 3333330711 3333330712 33333300007410
0713 9999990714 0000000715 0000000716 0000000717 0000000718 00000000007420
0719 0000000720 0000000721 0000000722 0625000801 0000000802 16666700007430
0803 0000000804 3333330805 0000000901 0000000902 0000000903 00000000007440
0904 0000000905 0000000906 0000000907 5000000908 9999990909 00000000007450
0910 0000000911 0000000912 0000000913 0000000914 0000000915 00000000007460
0916 1111111001 0000001002 0000001003 5000001004 0000001005 46153800007470
1006 2500001007 1366671008 0000001009 0000001010 0000001011 28571400007480
1101 2000001102 0000001103 3333331104 9999991105 9999991106 00000000007490
1107 0000001108 5000001109 0000001110 0000001111 0000001112 00000000007500
1113 4594591201 0000001202 0000001203 0000001204 5000001205 33333300007510
1301 0000001302 0000001303 0000001304 0000001305 3333331306 00000000007520
1307 0000001308 0909091401 0000001402 0000001403 0000001404 66666700007530
1405 0000001406 0000001407 9999991408 9999991409 9999991410 00000000007540
1411 2500001501 2000001502 0000001503 0000001504 0000001505 00000000007550
1506 0000001507 0000001508 0000001509 0000001510 0000001511 00000000007560
1512 0000001513 0000001514 0000001515 0000001516 0000001517 00000000007570
1518 0000001519 0434781520 1000001521 9999991522 5000001523 00000000007580
1524 0000001525 0000001526 0303031601 0000001602 0689661603 99999900007590
1604 0000001605 0000001606 1428571607 0000001608 0000001609 00000000007600
1610 0000001611 1111111612 2307691613 0000001614 0000001615 18333300007610
1701 0000001702 0000001703 0000001704 0000001705 0000001706 00000000007620
1707 0000001708 0000001709 0000001710 0000001711 0000001712 00000000007630
1713 0000001714 0000001801 0000001802 0000001803 0000001804 00000000007640
1805 0000001806 0000001807 0000001901 0000001902 2500001903 00000000007650
1904 9999991905 1250001906 0588241907 0000001908 2000001909 20000000007660
1910 3000001911 3000001912 0000001913 0000001914 9999991915 11111100007670
2001 0000002002 8000002003 6666672004 3333332005 5000002006 66666700007680
2007 5000002008 777777                                                  00007690
*                                                                       00007700
*                                                                       00007710
 33    FUNCTION   P22,D241      PROB NOR/MA NO ABORT AIRCREW             00007720
0101 9999990102 0000000103 5000000104 9999990105 0000000106 50000000007730
```

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0107  800000010B  9999990109  5000000110  9999990111  2500000112  00000000007740
0113  9999990114  5000000115  0000000116  9999990201  0000000202  00000000007750
0203  0000000204  0000000205  0000000301  0000000302  9999990303  00000000007760
0304  9999990305  0000000401  0000000402  0000000403  0000000404  00000000007770
0405  0000000406  0000000407  0000000408  0000000409  0000000410  00000000007780
0411  9999990412  0000000413  0000000414  0000000415  9999990416  00000000007790
0417  0000000418  0000000419  0000000420  0000000421  9999990422  00000000007800
0423  0000000424  0000000425  0000000501  7500000502  9999990503  00000000007810
0504  0000000505  0000000506  9999990507  6666070508  0000000509  00000000007820
0510  6000000511  0000000512  0000000513  0000000514  0000000515  00000000007830
0516  0000000517  0000000601  0000000602  0000000603  0000000604  00000000007840
0605  0666070606  3333330607  7142860608  9999990609  0000000610  00000000007850
0611  0666070612  9999990613  2222220614  9999990615  0000000616  00000000007860
0617  0000000618  0000000701  5000000702  0000000703  9999990704  99999900007670
0705  0000000706  0000000707  0000000708  0666070709  0000000710  00000000007880
0711  0000000712  9999990713  0000000714  0000000715  9999990716  99999900007890
0717  0000000718  9999990719  0000000720  0000000721  0000000722  00000000007900
0723  0000000724  9999990725  0000000801  0000000802  0000000803  66666700007910
0804  0000000805  0000000806  9999990807  0000000808  5000000809  00000000007920
0810  0000000811  0000000812  0000000813  0000000814  0000000815  00000000007930
0816  0000000817  0000000818  6660670819  0000000820  0000000821  00000000007940
0901  9999990902  0000000903  0000000904  9999990905  0000000906  00000000007950
0907  0000000908  0000001001  0000001002  9999991003  0000001004  00000000007960
1005  5000001006  0000001007  0000001008  0000001009  0000001010  00000000007970
1011  0000001012  0000001013  0000001014  0000001015  0000001016  00000000007980
1017  0000001018  0000001019  0000001101  0000001102  0000001103  00000000007990
1104  0000001105  0000001106  0000001107  0000001108  0000001109  33333300008000
1110  0000001201  0000001202  0000001203  0000001204  0000001205  00000000008010
1206  0000001207  0000001208  0000001209  0000001301  0000001302  00000000008020
1303  0000001304  0000001305  0000001401  0000001402  0000001403  00000000008030
1404  0000001405  0000001406  0000001407  0000001408  0000001409  00000000008040
1410  0000001411  0000001501  9999991502  0000001503  0000001504  00000000008050
1505  0000001506  0000001507  0000001508  0000001509  0000001510  00000000008060
1511  0000001512  0000001513  0000001514  0000001515  0000001516  00000000008070
1517  0000001518  0000001519  0000001520  0000001521  0000001522  00000000008080
1601  0000001602  0000001603  0000001701  0000001702  0000001703  00000000008090
1801  0000001802  0000001803  0000001901  0000001902  0000001903  00000000008100
1904  0000001905  0000001906  0000002001  0000002002  0000002003  00000000008110
2101  0000002201  9999992202  0000002203  0000002301  0000002401  00000000008120
2501  000000                                                      00008130
*                                                                 00008140
*                                                                 00008150
34   FUNCTION  FN46,L296   PROB NOR/MA PREFLIGHT                   00008160
0101  0000000102  0000000103  0000000104  0000000105  0000000106  00000000008170
0107  0000000108  0000000109  0000000110  0000000111  0000000112  99999900008180
0113  0000000114  0000000115  0000000116  0000000117  0000000118  00000000008190
0119  0000000120  1368420201  0000000202  0000000203  0000000204  00000000008200
0205  0000000206  0000000207  0000000208  0000000209  0000000210  00000000008210
0211  0000000212  5000000213  0000000214  0000000215  0000000216  18750000008220
0217  0000000218  0000000219  0000000220  0000000221  0000000222  00000000008230
0223  0000000224  1093770301  0000000302  0000000303  0000000304  00000000008240
0305  0000000306  0000000307  0000000308  0000000309  0000000310  00000000008250
0311  0000000312  0000000313  2352940401  5555550402  9999990403  00000000008260
0404  0000000405  7692300406  0000000407  0000000408  5555550409  99999900008270
0410  0000000411  0000000412  0000000413  9999990414  5777770415  00000000008280
0416  0000000417  0000000418  0000000419  0000000420  0000000421  00000000008290
0422  0000000423  0000000424  0000000425  0000000426  0000000427  00000000008300
0428  9705880429  9705880430  9705880431  9705880432  6842110501  00000000008310
0502  0000000503  0000000504  0000000505  0000000506  0000000507  00000000008320
0508  4347830601  0000000602  0000000603  0000000604  0000000605  00000000008330
0606  0000000607  0000000608  0000000609  0000000610  0000000611  00000000008340
0612  4800000613  0000000614  0454550615  0000000616  0000000617  00000000008350
0618  0000000619  0000000620  0000000621  0000000622  4225350623  48401800008360
0701  0000000702  0000000703  0000000704  0000000705  9999990706  00000000008370
0707  0000000708  0000000709  0000000710  0000000711  0000000712  00000000008380
0713  5555550714  0000000715  0000000716  0000000717  0000000718  00000000008390
```

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0719   0000000720   0000000721   000 0000722   0652170801   0000000802   00000000008400
0803   0000000804   0000000805   0000000901   0000000902   0000000903   00000000008410
0904   0000000905   0000000906   000 0000907   0000000908   0000000909   00000000008420
0910   0000000911   C000000912   0000000913   00 00000914   0000000915   00000000008430
0916   0000001001   0000001002   9999991003   0000001004   0000001005   00000000008440
1006   0000001007   0000001008   0000001009   0000001010   0000001011   00000000008450
1101   0000001102   0000001103   5000001104   3333331105   0000001106   00000000008460
1107   0000001108   0000001109   0000001110   0000001111   0000001112   00000000008470
1113   2000001201   0000001202   0000001203   4347831204   0000001205   00000000008480
1301   0000001302   0000001303   0000001304   0000001305   0000001306   00000000008490
1307   0000001308   0000001401   0000001402   0000001403   0000001404   00000000008500
1405   5000001406   0000001407   0000001408   0000001409   0000001410   00000000008510
1411   0000001501   0000001502   0000001503   0000001504   0000001505   00000000008520
1506   0000001507   0000001508   0000001509   0000001510   0000001511   00000000008530
1512   0000001513   0000001514   0000001515   0000001516   0000001517   00000000008540
1518   0000001519   0000001520   0000001521   0000001522   0000001523   00000000008550
1524   0000001525   0000001526   1313431601   0000001602   0000001603   00000000008560
1604   0000001605   0000001606   0000001607   0000001608   0000001609   00000000008570
1610   0000001611   0000001612   0000001613   0000001614   0000001615   09090900008580
1701   0000001702   0000001703   0000001704   0000001705   0000001706   00000000008590
1707   0000001708   0000001709   0000001710   0000001711   0000001712   00000000008600
1713   0000001714   0000001801   0000001802   0000001803   0000001804   00000000008610
1805   0000001806   0000001807   0000001901   0000001902   0000001903   00000000008620
1904   0000001905   0000001906   0000001907   0000001908   0000001909   00000000008630
1910   0000001911   0000001912   0000001913   0000001914   0000001915   29787200008640
2001   0000002002   0000002003   0000002004   0000002005   0000002006   00000000008650
2007   0000002008   000000                                              00008660
*                                                                       00008670
*                                                                       00008680
 35    FUNCTION     FN46,L296       PROB NOR/MA DAILY                    00008690
0101   0000000102   0000000103   0000000104   0000000105   0000000106   00000000008700
0107   0000000108   0000000109   0000000110   0000000111   0000000112   99999900008710
0113   0000000114   0000000115   0000000116   0000000117   0000000118   00000000008720
0119   0000000120   0842110201   0000000202   0000000203   0000000204   00000000008730
0205   0000000206   0000000207   0000000208   0000000209   0000000210   00000000008740
0211   0000000212   0000000213   0000000214   0000000215   0000000216   21794900008750
0217   0000000218   0000000219   0000000220   0000000221   0000000222   00000000008760
0223   0000000224   1085530301   0000000302   0000000303   0000000304   00000000008770
0305   0000000306   0000000307   0000000308   0000000309   0000000310   00000000008780
0311   0000000312   0000000313   0000000401   5555550402   0000000403   00000000008790
0404   0980390405   0000000406   0000000407   0000000408   0000000409   00000000008800
0410   0869570411   0000000412   0000000413   0000000414   1176470415   00000000008810
0416   0000000417   0000000418   0000000419   0000000420   0000000421   00000000008820
0422   0000000423   0000000424   0000000425   0000000426   0000000427   00000000008830
0428   1910110429   1910110430   1910110431   1910110432   0873440501   00000000008840
0502   0000000503   0000000504   0000000505   0000000506   6250000507   00000000008850
0508   0000000601   0000000602   1709400603   0000000604   3333330605   40000000008860
0606   0000000607   0000000608   0000000609   0000000610   0000000611   00000000008870
0612   0919540613   0000000614   0566420615   0000000616   0000000617   00000000008880
0618   0833330619   0000000620   0000000621   0000000622   0000000623   06137200008890
0701   5000000702   2222220703   0000000704   0000000705   0000000706   05524900008900
0707   0000000708   0000000709   6250000710   0000000711   0000000712   22222200008910
0713   1851850714   0000000715   0000000716   0000000717   0000000718   00000000008920
0719   0000000720   0000000721   0000000722   0680000801   0000000802   00000000008930
0803   0000000804   0000000805   0000000901   0000000902   0000000903   00000000008940
0904   0000000905   0000000906   0000000907   0000000908   0000000909   00000000008950
0910   0000000911   0000000912   0000000913   0000000914   0000000915   00000000008960
0916   0000001001   0000001002   0000001003   0000001004   0000001005   00000000008970
1006   0000001007   0000001008   0000001009   9999991010   0000001011   33333300008980
1101   0000001102   0000001103   0000001104   0000001105   0000001106   00000000008990
1107   0000001108   0000001109   0000001110   0000001111   0000001112   00000000009000
1113   1439511201   0000001202   0000001203   0000001204   0000001205   00000000009010
1301   0000001302   0000001303   0000001304   0000001305   0000001306   00000000009020
1307   0000001308   0000001401   0000001402   0000001403   0000001404   76923100009030
1405   9999991406   0000001407   3333331408   0000001409   0000001410   00000000009040
1411   0526261501   0000001502   0000001503   0000001504   0000001505   00000000009050
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1506  0000001507  0000001508  0000001509  0000001510  0000001511  00000000009060
1512  0000001513  0000001514  0000001515  0000001516  0000001517  00000000009070
1518  0000001519  0000001520  0000001521  0000001522  0000001523  00000000009080
1524  0000001525  0000001526  0280001601  0000001602  0000001603  00000000009090
1604  0000001605  0000001606  0000001607  0000001608  0000001609  00000000009100
1610  0000001611  0000001612  5000001613  0000001614  0000001615  09302300009110
1701  0000001702  0000001703  0000001704  0000001705  0000001706  00000000009120
1707  0000001708  0000001709  0000001710  0000001711  0000001712  00000000009130
1713  0000001714  0000001801  0000001802  0000001803  0000001804  00000000009140
1805  0000001806  0000001807  0000001901  0763361902  2666671903  00000000009150
1904  0000001905  0000001906  0000001907  1666671908  0000001909  00000000009160
1910  1666661911  1666661912  0000001913  2358491914  3030301915  14973300009170
2001  0000002002  0000002003  0000002004  9999992005  0000002006  00000000009180
2007  0000002008  171674                                           00009190
*                                                                   00009200
*                                                                   00009210
36    FUNCTION   FN5,C25        LOG NORMAL DISTRIBUTION              00009220
0     0     .025   332   .050   388   .100   466   .150   527   .200   580   00009230
.250  631   .300   680   .400   779   .500   883   .600   1003  .700   1148  00009240
.750  1237  .800   1345  .850   1482  .900   1675  .920   1782  .940   1921  00009250
.960  2119  .970   2261  .980   2465  .990   2845  .995   3200  .999   4183  00009260
.9998 5185                                                          00009270
*                                                                   00009280
37    FUNCTION   FN46,L296   PERCENT REM & REPL,PERCENT GS RPR/RCD   00009290
0101  9990000102  9990000103  9990000104  5000000105  0000000106  00000000009300
0107  0000000108  9990000109  9990000110  9990000111  0000000112  00000000009310
0113  9990000114  9990000115  0000000116  0000000117  5000000118  00000000009320
0119  9990000120  5800000201  9990000202  9990000203  0000000204  99900000009330
0205  9990000206  9990000207  9990000208  9990000209  9990000210  99900000009340
0211  9990000212  8240000213  9990000214  8820000215  8180000216  76900000009350
0217  9720000218  9990000219  9990000220  9990000221  9990000222  99900000009360
0223  9990000224  8040000301  9990000302  9990000303  9990000304  66700000009370
0305  9990000306  9990000307  9990000308  9990000309  9990000310  99900000009380
0311  9990000312  9990000313  8410000401  2860000402  0000000403  00000000009390
0404  2380000405  0910000406  9990000407  3000000408  0000000409  92300000009400
0410  9090000411  8390000412  8570000413  9990000414  0000000415  99900000009410
0416  9990000417  9990000418  9990000419  8330000420  8330000421  83300000009420
0422  8330000423  8330000424  8330000425  9990000426  9990000427  99900000009430
0428  8110000429  8110000430  8110000431  6130000501  9990000432  99900000009440
0502  8750000503  9990000504  9990000505  9990000506  9990000507  94700000009450
0508  8240000601  9990000602  9290000603  9990000604  3640000605  25000000009460
0606  9990000607  5000000608  7500000609  5000000610  9990000611  99900000009470
0612  2640000613  9990000614  6830000615  9990000616  9990000617  99900000009480
0618  7500000619  9990000620  9990000621  6880000622  5000000623  65200000009490
0701  9990000702  9990000703  3330000704  6670000705  9990000706  87900000009500
0707  0000000708  9990000709  8890000710  9990000711  8000000712  68200000009510
0713  9990000714  9990000715  5000000716  9990000717  9990000718  99900000009520
0719  5000000720  5000000721  9990000722  6020000801  9990000802  99900000009530
0803  9330000804  9230000805  9380000901  2860000902  8890000903  99900000009540
0904  9990000905  9990000906  9990000907  9990000908  9990000909  99900000009550
0910  9990000911  9990000912  9990000913  9990000914  9990000915  99900000009560
0916  8110001001  0000001002  9990001003  6670001004  0000001005  62500000009570
1006  0000001007  8180001008  9990001009  9990001010  0000001011  78600000009580
1101  6540001102  0000001103  4820001104  8330001105  9990001106  75000000009590
1107  9990001108  9990001109  9990001110  9990001111  6670001112  85700000009600
1113  8810001201  7780001202  9990001203  9990001204  5000001205  90700000009610
1301  9990001302  9990001303  9990001304  6000001305  9990001306  83300000009620
1307  8890001308  7780001401  9990001402  9990001403  9990001404  83300000009630
1405  9990001406  9990001407  9990001408  9990001409  9990001410  99900000009640
1411  5530001501  9630001502  7140001503  8330001504  6670001505  66700000009650
1506  9990001507  9990001508  5000001509  9990001510  7500001511  80000000009660
1512  9990001513  9990001514  9990001515  9990001516  9990001517  60000000009670
1518  7500001519  5490001520  9380001521  9990001522  7140001523  66700000009680
1524  5710001525  5710001526  7150001601  7780001602  9740001603  99900000009690
1604  7860001605  6000001606  0000001607  5000001608  6000001609  99900000009700
1610  8570001611  9990001612  9990001613  6670001614  9990001615  74500000009710
```

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1701  6670001702  9990001703  9990001704  9090001705  9990001706  00000000009720
1707  6670001708  9990001709  9420001710  9990001711  1670001712  66700000009730
1713  9990001714  6470001801  9570001802  9990001803  8400001804  99900000009740
1805  7500001806  9990001807  7500001901  9990001902  9990001903  50000000009750
1904  9990001905  9990001906  8750001907  6360001908  8570001909  85700000009760
1910  5710001911  5710001912  0000001913  0500001914  9990001915  56700000009770
2001  7860002002  9990002003  8330002004  5000002005  6670002006  50000000009780
2007  5000002008  873000                                         00009790
  38    FUNCTION    FN46,L296    PROB OF PART AVAILABILITY          00009800
0101  999   0102  999   0103  999   0104  999   0105  999   0106  999   00009810
0107  999   0108  999   0109  999   0110  999   0111  999   0112  999   00009820
0113  999   0114  999   0115  999   0116  999   0117  999   0118  999   00009830
0119  999   0120  909   0201  999   0202  999   0203  999   0204  999   00009840
0205  999   0206  999   0207  999   0208  999   0209  999   0210  999   00009850
0211  999   0212  857   0213  999   0214  733   0215  999   0216  999   00009860
0217  800   0218  999   0219  400   0220  999   0221  999   0222  999   00009870
0223  999   0224  932   0301  999   0302  999   0303  000   0304  999   00009880
0305  999   0306  000   0307  999   0308  999   0309  999   0310  999   00009890
0311  999   0312  999   0313  854   0401  000   0402  999   0403  999   00009900
0404  000   0405  999   0406  999   0407  272   0408  999   0409  600   00009910
0410  867   0411  143   0412  999   0413  999   0414  999   0415  000   00009920
0416  999   0417  833   0418  667   0419  500   0420  500   0421  500   00009930
0422  500   0423  500   0424  500   0425  999   0426  999   0427  500   00009940
0428  600   0429  600   0430  600   0431  600   0432  800   0501  667   00009950
0502  429   0503  724   0504  999   0505  999   0506  999   0507  999   00009960
0508  857   0601  999   0602  900   0603  999   0604  999   0605  999   00009970
0606  999   0607  999   0608  999   0609  999   0610  999   0611  000   00009980
0612  963   0613  999   0614  804   0615  999   0616  999   0617  800   00009990
0618  694   0619  999   0620  999   0621  875   0622  833   0623  843   00010000
0701  999   0702  875   0703  999   0704  999   0705  999   0706  999   00010010
0707  999   0708  889   0709  919   0710  976   0711  999   0712  630   00010020
0713  700   0714  999   0715  999   0716  000   0717  999   0718  999   00010030
0719  999   0720  999   0721  999   0722  538   0801  999   0802  714   00010040
0803  999   0804  583   0805  923   0901  999   0902  999   0903  999   00010050
0904  999   0905  500   0906  750   0907  667   0908  750   0909  999   00010060
0910  999   0911  980   0912  999   0913  999   0914  999   0915  999   00010070
0916  873   1001  999   1002  999   1003  999   1004  999   1005  556   00010080
1006  999   1007  999   1008  999   1009  999   1010  999   1011  400   00010090
1101  000   1102  999   1103  000   1104  000   1105  999   1106  167   00010100
1107  800   1108  875   1109  999   1110  999   1111  999   1112  636   00010110
1113  787   1201  999   1202  864   1203  999   1204  999   1205  806   00010120
1301  857   1302  999   1303  999   1304  999   1305  857   1306  400   00010130
1307  750   1308  722   1401  000   1402  999   1403  999   1404  600   00010140
1405  999   1406  999   1407  500   1408  000   1409  000   1410  999   00010150
1411  250   1501  962   1502  999   1503  999   1504  999   1505  500   00010160
1506  999   1507  000   1508  000   1509  999   1510  999   1511  999   00010170
1512  600   1513  999   1514  999   1515  999   1516  999   1517  999   00010180
1518  333   1519  500   1520  933   1521  999   1522  999   1523  999   00010190
1524  000   1525  000   1526  808   1601  867   1602  639   1603  999   00010200
1604  909   1605  719   1606  999   1607  999   1608  999   1609  200   00010210
1610  667   1611  999   1612  500   1613  999   1614  999   1615  855   00010220
1701  999   1702  999   1703  999   1704  950   1705  999   1706  999   00010230
1707  999   1708  999   1709  959   1710  999   1711  999   1712  999   00010240
1713  999   1714  900   1801  909   1802  500   1803  999   1804  999   00010250
1805  999   1806  999   1807  333   1901  999   1902  774   1903  750   00010260
1904  143   1905  400   1906  900   1907  333   1908  000   1909  000   00010270
1910  650   1911  650   1912  999   1913  999   1914  250   1915  843   00010280
2001  818   2002  900   2003  999   2004  667   2005  999   2006  999   00010290
2007  667   2008  933                                         00010300
  39    FUNCTION    P1,E3        VARIABLE SORT FOR WORK CENTER      00010310
  1   V50   2   V49   3   V48                                       00010320
  *                                                                00010330
  *                                                                00010340
  40    FUNCTION    FN46,L296    SKILL CODE-WORK CENTER ON A/C REPAIR  00010350
0101  0000000102  0000000103  0000000104  0000030105  0003070106  00030700010360
0107  0003070108  0000000109  0000000110  0000000111  0000070112  00010300010370
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0113    0000000114    0000000115    0003070116    0003070117    0000070118    00000700010380
0119    0000000120    0007030201    0000000202    0000000203    0000030204    000000000 10390
0205    0000000206    0000000207    0000000208    0000000209    0000000210    00000000010400
0211    0000000212    0000030213    0000000214    0000030215    0000100216    00030200010410
0217    0000030218    0000000219    0000000220    0000000221    0000000222    00000000010420
0223    0000000224    0000030301    0000000302    0000000303    0000000304    00000300010430
0305    0000000306    0000000307    0000000308    0000000309    0000000310    00000000010440
0311    0000000312    0000000313    0010030401    0002030402    0000030403    00020300010450
0404    0006030405    0006030406    0000000407    0001030408    0001030409    00000300010460
0410    0005030411    0003060412    0000030413    0000000414    0001030415    00000000010470
0416    0000000417    0000000418    0000000419    0000090420    0000090421    00000900010480
0422    0000090423    0000090424    0000090425    0000000426    0000000427    00000000010490
0428    0006070429    0006070430    0006070431    0006070432    0002030501    00000000010500
0502    0000030503    0000000504    0000000505    0000000506    0000000507    00000100010510
0508    0007030601    0000000602    0000030603    0000000604    0001030605    00060300010520
0606    0000000607    0000030608    0000030609    0001030610    0000000611    00000000010530
0612    0000030613    0000000614    0009030615    0000000616    0000000617    00000000010540
0618    0008030619    0000000620    0000000621    0008070622    0000930623    00060300010550
0701    0000000702    0000000703    0000070704    0000030705    0000000706    00020300010560
0707    0009030708    0000000709    0009030710    0000000711    0000030712    00030900010570
0713    0000000714    0000000715    0000030716    0000000717    0000000718    00000000010580
0719    0000030720    0000030721    0000000722    0009030801    0000000802    00000000010590
0803    0000030804    0000100805    0000080901    0003080902    9000040903    00000000010600
0904    0000000905    0000000906    0000000907    0000000908    0000000909    00000000010610
0910    0000000911    0000000912    0000000913    0000000914    0000000915    00000000010620
0916    0003081001    0002071002    0000001003    0003081004    0000031005    00020400010630
1006    0008051007    0008051008    0000001009    0000001010    0000031011    00030500010640
1101    0010031102    0005031103    0000031104    0000031105    0000001106    00030200010650
1107    0000001108    0000001109    0000001110    0000001111    0000031112    00000300010660
1113    0008031201    0006031202    0000001203    0000001204    0000031205    00080300010670
1301    0000001302    0000001303    0000001304    0000071305    0000001306    00000400010680
1307    0000041308    0006031401    0000001402    0000001403    0000001404    00000300010690
1405    0000001406    0000001407    0000001408    0000001409    0000001410    00000000010700
1411    0008031501    0000031502    0000081503    0000091504    0000081505    00000400010710
1506    0000001507    0000001508    0000041509    0000001510    0000081511    00000800010720
1512    0000001513    0010041514    0000001515    0000001516    0000001517    00000800010730
1518    0000021519    0009081520    0010031521    0000001522    0000081523    00000800010740
1524    0003081525    0000101526    0008031601    0000101602    0000041603    00000000010750
1604    0000041605    0000041606    0000041607    0000041608    0000041609    00000000010760
1610    0000041611    0000001612    0000001613    0000041614    0000001615    00000400010770
1701    0004031702    0000001703    0000001704    0000041705    0000001706    00000400010780
1707    0000041708    0000001709    0000041710    0000001711    0001041712    00000400010790
1713    0000001714    0000041801    0000041802    0000001803    0000001804    00000000010800
1805    0000041806    0000001807    0000041901    0000001902    0000001903    00000700010810
1904    0000001905    0000001906    0010081907    0009011908    0010091909    00100900010820
1910    0009031911    0009031912    0002031913    0009071914    0000001915    00090300010830
2001    0000032002    0000002003    0000092004    0008032005    0000032006    00030900010840
2007    0000032008    000203                                                  00010850
*                                                                              00010860
*                                                                              00010670
  41    FUNCTION      P1,E3         VARIABLE SORT MANPOWER DEFINITION          00010880
   1    V54    2      V53    3      V52                                         00010890
*                                                                              00010900
*                                                                              00010910
  42    FUNCTION      FN46,L296     MPR REMOVE & REPLACE 2NDARY WC, PRIMARY WC00010920
0101    0000100102    0002160103    0006050104    0006040105    0000000106    00000000010930
0107    0000000108    0000100109    0004060110    0006040111    0000000112    00000000010940
0113    0000200114    0000200115    0000000116    0000000117    0010100118    00000000010950
0119    0000100120    0004120201    0000170202    0004060203    0000000204    00001300010960
0205    0006060206    0000150207    0002080208    0005150209    0000100210    00011700010970
0211    0004060212    0001170213    0000040214    0001090215    0004060216    00042100010980
0217    0000190218    0000260219    0006100220    0000100221    0000130222    00001000010990
0223    0002090224    0001120301    0000100302    0000100303    0000100304    00001000011000
0305    0000100306    0000110307    0000200308    0000100309    0000200310    00051100011010
0311    0006100312    0000200313    0004140401    0001280402    000000w403    00000000011020
0404    0001290405    0000200406    0000120407    0001170408    0000000404    00001200011030
```

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0410  0001160411  0001150412  0000150413  0003170414  0000280415  00001100011040
0416  0000100417  0000190418  0000170419  0004200420  0004200421  00042000011050
0422  0004200423  0004200424  0004200425  0007130426  0004090427  00011200011060
0428  0003140429  0003140430  0003140431  0003140432  0014040501  00031000011070
0502  0000190503  0001120504  0000100505  0000100506  0002090507  00010900011080
0508  0003070601  0001150602  0004160603  0006130604  0004110605  00003000011090
0606  0000200607  0000100608  0001120609  0000300610  0000200611  00002000011100
0612  0000200613  0000140614  0002120615  0000100616  0000130617  00001000011110
0618  0001110619  0002080620  0002080621  0006070622  0002130623  00011100011120
0701  0002080702  0004060703  0000400704  0001090705  0006080706  00021500011130
0707  0000000708  0005090709  0007080710  0004090711  0006120712  00070600011140
0713  0003080714  0002080715  0000100716  0000100717  0000200718  00001000011150
0719  0000140720  0000100721  0000100722  0004090801  0002080802  00030700011160
0803  0003080804  0006040805  0005070901  0003070902  0000100903  00001000011170
0904  0000100905  0002100906  0001090907  0000100908  0003110909  00040600011180
0910  0001090911  0001090912  0005050913  0005050914  0000100915  00001000011190
0916  0006050001  0000001002  0002201003  0000171004  0000001005  00012000011200
1006  0000001007  0003121008  0000011009  0000141010  0000001011  00031100011210
1101  0002121102  0000001103  0004101104  0002111105  0004101106  00050500011220
1107  0006061108  0001081109  0000101110  0000201111  0000151112  00001100011230
1113  0001101201  0009011202  0000161203  0007041204  0001131205  00030900011240
1301  0001091302  0000101303  0000101304  0000101305  0000121306  00040700011250
1307  0006061308  0004071401  0000101402  0003071403  0005181404  00041300011260
1405  0000301406  0000101407  0000201408  0000201409  0002091410  00001000011270
1411  0009101501  0004061502  0000101503  0005071504  0003071505  00001000011280
1506  0000101507  0000101508  0000101509  0000101510  0004061511  00050500011290
1512  0003101513  0003071514  0000101515  0000111516  0000101517  00030700011300
1518  0002081519  0002111520  0005051521  0005051522  0001121523  00050500011310
1524  0002081525  0003071526  0002081601  0000111602  0001111603  00010900011320
1604  0000121605  0000121606  0000001607  0000151608  0000101609  00001000011330
1610  0002081611  0000111612  0000101613  0000181614  0000151615  00011000011340
1701  0003071702  0000171703  0001091704  0000101705  0000101706  00000000011350
1707  0003071708  0000101709  0003071710  0005051711  0000101712  00001000011360
1713  0000101714  0001101801  0000101802  0000101803  0001091804  00002000011370
1805  0004161806  0000131807  0000101901  0000101902  0001091903  00041100011380
1904  0004091905  0002081906  0003071907  0001191908  0009121909  00091200011390
1910  0008111911  0008111912  0000001913  0005161914  0008101915  00051000011400
2001  0003082002  0004072003  0002132004  0000202005  0000192006  00060800011410
2007  0005142008  000606                                          00011420
*                                                                  00011430
*                                                                  00011440
  43    FUNCTION    FN46,L296   OFF EQUIP MEMT,REM & REPLACE MEMT   00011450
0101  0000700102  0000590103  0000190104  0000090105  0000000106  00000000011460
0107  0000000108  0000460109  0000180110  0000230111  0000000112  00000000011470
0113  0000300114  0000300115  0000000116  0000000117  0000250118  00000000011480
0119  0000170120  0000180201  0000200202  0000170203  0000000204  00001600011490
0205  0000230206  0000180207  0000120208  0000000209  0000150210  00003500011500
0211  0000250212  0000220213  0000420214  0000210215  0000240216  00001800011510
0217  0000170218  0000340219  0000230220  0000100221  0000130222  00002300011520
0223  0000140224  0000200301  0000150302  0000150303  0000300304  00001500011530
0305  0000130306  0000230307  0000150308  0000150309  0000270310  00002400011540
0311  0000170312  0000120313  0000200401  0001750402  0000000403  00000000011550
0404  0002380405  0000150406  0000200407  0000580408  0000000409  00001800011560
0410  0000240411  0000200412  0000330413  0000200414  0000350415  00001300011570
0416  0000200417  0000590418  0000190419  0000260420  0000260421  00002600011580
0422  0000260423  0000260424  0000260425  0000230426  0000450427  00001600011590
0428  0000170429  0000170430  0000170431  0000170432  0000510501  00001200011600
0502  0000150503  0000240504  0000140505  0000100506  0000110507  00001600011610
0508  0000130601  0000840602  0001030603  0000470604  0002860605  00004000011620
0606  0000500607  0000050608  0000370609  0000500610  0003750611  00002200011630
0612  0000870613  0000700614  0000310615  0000360616  0000320617  00001200011640
0618  0000210619  0000120620  0000230621  0000440622  0000230623  00002100011650
0701  0000150702  0000170703  0000400704  0000050705  0000090706  00001700011660
0707  0000000708  0000370709  0000410710  0000480711  0000470712  00002000011670
0713  0000280714  0000170715  0000200716  0000100717  0000200718  00001300011680
0719  0000090720  0000220721  0000110722  0000230801  0000250802  00004400011690
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0803   0000120804   0000160805   0000160901   0000120902   0000130903   00000800011700
0904   0000120905   0000320906   0000220907   0000120908   0000120909   00001500011710
0910   0000070911   0000170912   0000190913   0000020914   0000050915   00002000011720
0916   0000191001   0000001002   0000451003   0000301004   0000001005   00013000011730
1006   0000001007   0000391008   0000201009   0002801010   000000L1011  00003400011740
1101   0000251102   0000001103   0000281104   0000221105   0000151106   00001300011750
1107   0000081108   0000141109   0000651110   0000091111   0000351112   00002700011760
1113   0000151201   0000091202   0000151203   0000111204   0000551205   00002200011770
1301   0000091302   0000031303   0000031304   0000141305   0000121306   00001000011780
1307   0000071308   0000121401   0000151402   0000201403   0000131404   00006100011790
1405   0001731406   0000081407   0000651408   0000351409   0000431410   00000500011800
1411   0000431501   0000111502   0000061503   0000161504   0000101505   00001000011810
1506   0000101507   0000081508   0000101509   0000061510   0000041511   00000800011820
1512   0000091513   0000091514   0000101515   0000171516   0000261517   00001000011830
1518   0000091519   0000171520   0000071521   0000081522   0000111523   00001000011840
1524   0000081525   0000151526   0000101601   0000111602   0000101603   00002100011850
1604   0000121605   0000061606   0000001607   0000061608   0000111609   00000900011860
1610   0000111611   0000211612   0000161613   0000131614   0000151615   00001800011870
1701   0000141702   0000371703   0000141704   0000061705   0000081706   00000000011880
1707   0000101708   0000071709   0000071710   0000111711   0000101712   00000700011890
1713   0000091714   0000361801   0000061802   0000151803   0000101804   00007000011900
1805   0000211806   0000221807   0000061901   0000061902   0000111903   00018100011910
1904   0000221905   0000101906   0000121907   0001071908   0001081909   00010800011920
1910   0001931911   0001931912   0000001913   0001101914   0000781915   00004500011930
2001   0000392002   0000222003   0000092004   0000732005   0000232006   00001800011940
2007   0000672008   000020                                                  00011950
*                                                                           00011960
```

```
44      FUNCTION   FN46,L296      TEST HOP CANDIDATES               00011970
0101 0   0102 1   0103 0   0104 0   0105 0   0106 0                 00011980
0107 0   0108 0   0109 0   0110 0   0111 0   0112 1                 00011990
0113 1   0114 0   0115 0   0116 0   0117 0   0118 0                 00012000
0119 0   0120 1   0201 0   0202 0   0203 0   0204 0                 00012010
0205 0   0206 0   0207 0   0208 0   0209 0   0210 0                 00012020
0211 0   0212 0   0213 0   0214 1   0215 0   0216 0                 00012030
0217 0   0218 0   0219 0   0220 0   0221 0   0222 0                 00012040
0223 0   0224 0   0301 0   0302 0   0303 0   0304 0                 00012050
0305 0   0306 1   0307 0   0308 1   0309 1   0310 1                 00012060
0311 0   0312 0   0313 1   0401 1   0402 1   0403 0                 00012070
0404 0   0405 1   0406 1   0407 1   0408 0   0409 1                 00012080
0410 1   0411 1   0412 0   0413 0   0414 1   0415 0                 00012090
0416 1   0417 0   0418 0   0419 1   0420 1   0421 1                 00012100
0422 1   0423 1   0424 1   0425 1   0426 0   0427 1                 00012110
0428 1   0429 1   0430 1   0431 1   0432 1   0501 0                 00012120
0502 0   0503 0   0504 0   0505 0   0506 0   0507 0                 00012130
0508 0   0601 0   0602 0   0603 0   0604 1   0605 0                 00012140
0606 1   0607 0   0608 0   0609 1   0610 1   0611 1                 00012150
0612 1   0613 0   0614 1   0615 0   0616 0   0617 0                 00012160
0618 0   0619 0   0620 0   0621 1   0622 1   0623 1                 00012170
0701 0   0702 0   0703 1   0704 0   0705 0   0706 1                 00012180
0707 1   0708 1   0709 1   0710 0   0711 1   0712 1                 00012190
0713 0   0714 0   0715 0   0716 0   0717 0   0718 1                 00012200
0719 0   0720 1   0721 0   0722 1   0801 0   0802 0                 00012210
0803 0   0804 0   0805 1   0901 0   0902 0   0903 0                 00012220
0904 0   0905 0   0906 0   0907 0   0908 0   0909 0                 00012230
0910 0   0911 0   0912 0   0913 0   0914 0   0915 0                 00012240
0916 0   1001 0   1002 1   1003 1   1004 0   1005 1                 00012250
1006 0   1007 0   1008 0   1009 1   1010 0   1011 1                 00012260
1101 1   1102 0   1103 1   1104 0   1105 0   1106 0                 00012270
1107 0   1108 0   1109 0   1110 0   1111 1   1112 1                 00012280
1113 1   1201 0   1202 0   1203 0   1204 0   1205 1                 00012290
1301 0   1302 0   1303 0   1304 0   1305 0   1306 0                 00012300
1307 0   1308 0   1401 0   1402 0   1403 0   1404 0                 00012310
1405 1   1406 0   1407 1   1408 1   1409 0   1410 0                 00012320
1411 1   1501 0   1502 0   1503 0   1504 0   1505 1                 00012330
1506 1   1507 1   1508 1   1509 1   1510 1   1511 0                 00012340
1512 1   1513 0   1514 0   1515 1   1516 0   1517 0                 00012350
```

1518	0	1519	1	1520	0	1521	0	1522	0	1523	0	00012360
1524	0	1525	0	1526	1	1601	1	1602	1	1603	0	00012370
1604	0	1605	1	1606	1	1607	1	1608	1	1609	0	00012380
1610	1	1611	1	1612	0	1613	0	1614	0	1615	1	00012390
1701	0	1702	0	1703	0	1704	0	1705	0	1706	0	00012400
1707	0	1708	0	1709	0	1710	0	1711	0	1712	0	00012410
1713	0	1714	1	1801	0	1802	0	1803	0	1804	0	00012420
1805	0	1806	0	1807	1	1901	0	1902	0	1903	0	00012430
1904	1	1905	0	1906	1	1907	0	1908	1	1909	1	00012440
1910	1	1911	1	1912	0	1913	0	1914	1	1915	1	00012450
2001	0	2002	0	2003	0	2004	0	2005	0	2006	0	00012460
2007	0	2008	0									00012470
45	FUNCTION	FN46,L296		SUPPLY DELAY								00012480
0101	0	0102	0	0103	0	0104	0	0105	0	0106	0	00012490
0107	0	0108	0	0109	0	0110	0	0111	0	0112	0	00012500
0113	0	0114	0	0115	0	0116	0	0117	0	0118	0	00012510
0119	0	0120	1307	0201	0	0202	0	0203	0	0204	0	00012520
0205	0	0206	0	0207	0	0208	0	0209	0	0210	0	00012530
0211	0	0212	2880	0213	0	0214	3445	0215	0	0216	0	00012540
0217	3771	0218	0	0219	1727	0220	0	0221	0	0222	0	00012550
0223	0	0224	2640	0301	0	0302	0	0303	960	0304	0	00012560
0305	0	0306	4080	0307	0	0308	0	0309	0	0310	0	00012570
0311	0	0312	0	0313	900	0401	4350	0402	0	0403	0	00012580
0404	3957	0405	0	0406	0	0407	3957	0408	0	0409	1787	00012590
0410	840	0411	1767	0412	0	0413	0	0414	0	0415	2400	00012600
0416	0	0417	5040	0418	1200	0419	2640	0420	2640	0421	2640	00012610
0422	2640	0423	2640	0424	2640	0425	0	0426	0	0427	1787	00012620
0428	2160	0429	2160	0430	2160	0431	2160	0432	1787	0501	1440	00012630
0502	720	0503	373	0504	0	0505	0	0506	0	0507	0	00012640
0508	720	0601	0	0602	880	0603	0	0604	0	0605	0	00012650
0606	0	0607	0	0608	0	0609	0	0610	0	0611	1440	00012660
0612	1440	0613	0	0614	2417	0615	0	0616	0	0617	1440	00012670
0618	1197	0619	0	0620	0	0621	1440	0622	1440	0623	1440	00012680
0701	0	0702	4960	0703	0	0704	0	0705	0	0706	0	00012690
0707	0	0708	960	0709	3503	0710	3360	0711	0	0712	4900	00012700
0713	9920	0714	0	0715	0	0716	20	0717	0	0718	0	00012710
0719	0	0720	0	0721	0	0722	2107	0801	1920	0802		00012720
0803	0	0804	1680	0805	1200	0901	0	0902	0	0903	0	00012730
0904	0	0905	3017	0906	480	0907	963	0908	4560	0909	0	00012740
0910	0	0911	3017	0912	0	0913	0	0914	0	0915	0	00012750
0916	3017	1001	0	1002	0	1003	0	1004	0	1005	7440	00012760
1006	0	1007	0	1008	0	1009	0	1010	0	1011	2320	00012770
1101	5966	1102	0	1103	3745	1104	1800	1105	0	1106	240	00012780
1107	1800	1108	1800	1109	0	1110	0	1111	0	1112	2240	00012790
1113	1800	1201	0	1202	773	1203	0	1204	0	1205	1520	00012800
1301	2360	1302	0	1303	0	1304	0	1305	3840	1306	2360	00012810
1307	1800	1308	2360	1401	2160	1402	0	1403	0	1404	2880	00012820
1405	0	1406	0	1407	2160	1408	1280	1409	2160	1410	0	00012830
1411	2160	1501	2742	1502	0	1503	0	1504	0	1505	2742	00012840
1506	0	1507	1080	1508	2742	1509	0	1510	0	1511	0	00012850
1512	1440	1513	0	1514	0	1515	0	1516	0	1517	0	00012860
1518	2040	1519	3594	1520	10	1521	0	1522	0	1523	0	00012870
1524	1320	1525	960	1526	2742	1601	1825	1602	2640	1603	0	00012880
1604	1825	1605	1762	1606	0	1607	0	1608	0	1609	1825	00012890
1610	1080	1611	0	1612	1257	1613	0	1614	0	1615	7440	00012900
1701	0	1702	0	1703	0	1704	0	1705	0	1706	0	00012910
1707	0	1708	0	1709	0	1710	0	1711	0	1712	0	00012920
1713	0	1714	0	1801	0	1802	0	1803	0	1804	0	00012930
1805	0	1806	0	1807	0	1901	0	1902	1637	1903	1626	00012940
1904	6600	1905	1970	1906	1626	1907	1320	1908	4410	1909	4410	00012950
1910	1980	1911	1980	1912	0	1913	0	1914	6540	1915	1626	00012960
2001	10320	2002	480	2003	0	2004	1680	2005	0	2006	0	00012970
2007	6720	2008	4160									00012980
46	FUNCTION	P22,D296		ELEMENTS TABLE CODE								00012990
0101	1	0102	2	0103	3	0104	4	0105	5	0106	6	00013000
0107	7	0108	8	0109	9	0110	10	0111	11	0112	12	00013010

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0113	13	0114	14	0115	15	0116	16	0117	17	0118	18	00013020
0119	19	0120	20	0201	21	0202	22	0203	23	0204	24	00013030
0205	25	0206	26	0207	27	0208	28	0209	29	0210	30	00013040
0211	31	0212	32	0213	33	0214	34	0215	35	0216	36	00013050
0217	37	0218	38	0219	39	0220	40	0221	41	0222	42	00013060
0223	43	0224	44	0301	45	0302	46	0303	47	0304	48	00013070
0305	49	0306	50	0307	51	0308	52	0309	53	0310	54	00013080
0311	55	0312	56	0313	57	0401	58	0402	59	0403	60	00013090
0404	61	0405	62	0406	63	0407	64	0408	65	0409	66	00013100
0410	67	0411	68	0412	69	0413	70	0414	71	0415	72	00013110
0416	73	0417	74	0418	75	0419	76	0420	77	0421	78	00013120
0422	79	0423	80	0424	81	0425	82	0426	83	0427	84	00013130
0428	85	0429	86	0430	87	0431	88	0432	89	0501	90	00013140
0502	91	0503	92	0504	93	0505	94	0506	95	0507	96	00013150
0508	97	0601	98	0602	99	0603	100	0604	101	0605	102	00013160
0606	103	0607	104	0608	105	0609	106	0610	107	0611	108	00013170
0612	109	0613	110	0614	111	0615	112	0616	113	0617	114	00013180
0618	115	0619	116	0620	117	0621	118	0622	119	0623	120	00013190
0701	121	0702	122	0703	123	0704	124	0705	125	0706	126	00013200
0707	127	0708	128	0709	129	0710	130	0711	131	0712	132	00013210
0713	133	0714	134	0715	135	0716	136	0717	137	0718	138	00013220
0719	139	0720	140	0721	141	0722	142	0801	143	0802	144	00013230
0803	145	0804	146	0805	147	0901	148	0902	149	0903	150	00013240
0904	151	0905	152	0906	153	0907	154	0908	155	0909	156	00013250
0910	157	0911	158	0912	159	0913	160	0914	161	0915	162	00013260
0916	163	1001	164	1002	165	1003	166	1004	167	1005	168	00013270
1006	169	1007	170	1008	171	1009	172	1010	173	1011	174	00013280
1101	175	1102	176	1103	177	1104	178	1105	179	1106	180	00013290
1107	181	1108	182	1109	183	1110	184	1111	185	1112	186	00013300
1113	187	1201	188	1202	189	1203	190	1204	191	1205	192	00013310
1301	193	1302	194	1303	195	1304	196	1305	197	1306	198	00013320
1307	199	1308	200	1401	201	1402	202	1403	203	1404	204	00013330
1405	205	1406	206	1407	207	1408	208	1409	209	1410	210	00013340
1411	211	1501	212	1502	213	1503	214	1504	215	1505	216	00013350
1506	217	1507	218	1508	219	1509	220	1510	221	1511	222	00013360
1512	223	1513	224	1514	225	1515	226	1516	227	1517	228	00013370
1518	229	1519	230	1520	231	1521	232	1522	233	1523	234	00013380
1524	235	1525	236	1526	237	1601	238	1602	239	1603	240	00013390
1604	241	1605	242	1606	243	1607	244	1608	245	1609	246	00013400
1610	247	1611	248	1612	249	1613	250	1614	251	1615	252	00013410
1701	253	1702	254	1703	255	1704	256	1705	257	1706	258	00013420
1707	259	1708	260	1709	261	1710	262	1711	263	1712	264	00013430
1713	265	1714	266	1801	267	1802	268	1803	269	1804	270	00013440
1805	271	1806	272	1807	273	1901	274	1902	275	1903	276	00013450
1904	277	1905	278	1906	279	1907	280	1908	281	1909	282	00013460
1910	283	1911	284	1912	285	1913	286	1914	287	1915	288	00013470
2001	289	2002	290	2003	291	2004	292	2005	293	2006	294	00013480
2007	295	2008	296									00013490
*												00013500
*												00013510
47	FUNCTION		P22,02		PERCENT NRTS (1-8), PERCENT NRTS (1-9)							00013520
101	0	2008	0									00013530
*												00013540
*												00013550
48	FUNCTION		FN46,L296		PROB OF NO CANNIBALIZATION GIVEN NORS							00013560
0101	999	0102	999	0103	999	0104	999	0105	999	0106	999	00013570
0107	999	0108	999	0109	999	0110	999	0111	999	0112	999	00013580
0113	999	0114	999	0115	999	0116	999	0117	999	0118	999	00013590
0119	999	0120	667	0201	999	0202	999	0203	999	0204	999	00013600
0205	999	0206	999	0207	999	0208	999	0209	999	0210	999	00013610
0211	999	0212	000	0213	999	0214	250	0215	999	0216	999	00013620
0217	571	0218	999	0219	999	0220	999	0221	999	0222	999	00013630
0223	999	0224	667	0301	999	0302	999	0303	000	0304	999	00013640
0305	999	0306	667	0307	999	0308	999	0309	999	0310	999	00013650
0311	999	0312	999	0313	667	0401	999	0402	999	0403	999	00013660
0404	333	0405	999	0406	999	0407	429	0408	999	0409	000	00013670

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0410  000   0411  999   0412  999   0413  999   0414  999   0415  999   00013680
0416  999   0417  999   0418  000   0419  500   0420  500   0421  500   00013690
0422  500   0423  500   0424  500   0425  999   0426  999   0427  000   00013700
0428  000   0429  000   0430  000   0431  000   0432  722   0501  000   00013710
0502  000   0503  000   0504  999   0505  999   0506  999   0507  999   00013720
0508  999   0601  999   0602  999   0603  999   0604  999   0605  999   00013730
0606  999   0607  999   0608  999   0609  999   0610  999   0611  000   00013740
0612  000   0613  999   0614  273   0615  999   0616  999   0617  000   00013750
0618  636   0619  999   0620  999   0621  000   0622  000   0623  000   00013760
0701  999   0702  000   0703  999   0704  999   0705  999   0706  999   00013770
0707  999   0708  999   0709  667   0710  999   0711  999   0712  100   00013780
0713  000   0714  999   0715  999   0716  000   0717  999   0718  999   00013790
0719  999   0720  999   0721  999   0722  611   0801  999   0802  500   00013800
0803  999   0804  000   0805  999   0901  999   0902  999   0903  999   00013810
0904  999   0905  000   0906  000   0907  000   0908  000   0909  999   00013820
0910  999   0911  000   0912  999   0913  999   0914  999   0915  999   00013830
0916  000   1001  999   1002  999   1003  999   1004  999   1005  000   00013840
1006  999   1007  999   1008  999   1009  999   1010  999   1011  667   00013850
1101  438   1102  999   1103  000   1104  000   1105  999   1106  000   00013860
1107  000   1108  000   1109  999   1110  999   1111  999   1112  000   00013870
1113  000   1201  999   1202  667   1203  999   1204  999   1205  000   00013880
1301  000   1302  999   1303  999   1304  999   1305  000   1306  000   00013890
1307  999   1308  000   1401  000   1402  999   1403  999   1404  000   00013900
1405  999   1406  999   1407  000   1408  000   1409  000   1410  999   00013910
1411  467   1501  000   1502  999   1503  999   1504  999   1505  000   00013920
1506  999   1507  500   1508  000   1509  999   1510  999   1511  999   00013930
1512  000   1513  999   1514  999   1515  999   1516  999   1517  999   00013940
1518  999   1519  071   1520  000   1521  999   1522  999   1523  999   00013950
1524  000   1525  500   1526  000   1601  000   1602  000   1603  999   00013960
1604  000   1605  444   1606  999   1607  999   1608  999   1609  000   00013970
1610  999   1611  999   1612  500   1613  999   1614  999   1615  000   00013980
1701  999   1702  999   1703  999   1704  000   1705  999   1706  999   00013990
1707  999   1708  999   1709  000   1710  999   1711  999   1712  999   00014000
1713  999   1714  000   1801  000   1802  000   1803  999   1804  999   00014010
1805  999   1806  999   1807  000   1901  999   1902  571   1903  000   00014020
1904  750   1905  777   1906  000   1907  999   1908  667   1909  667   00014030
1910  000   1911  000   1912  999   1913  999   1914  667   1915  000   00014040
2001  000   2002  000   2003  999   2004  000   2005  999   2006  999   00014050
2007  000   2008  667                                                   00014060
  49     FUNCTION    P22,D2      DS AND GS SHOPS (DUMMY)                 00014070
101    55     2902   55                                                 00014080
  *                                                                     00014090
  *                                                                     00014100
  51     FUNCTION    RN1,D2      PROB MULTI FAIL BAD PART FROM SUPPLY    00014110
 .1     1      .9     1                                                 00014120
  *                                                                     00014130
  *                                                                     00014140
  52     FUNCTION    P22,D2   PCT ITG DS-O RPR/REM-RPL, PCT DS RPR/RC'D  00014150
101    0      2008   0                                                  00014160
  53     FUNCTION    FN46,L296   MEMT ON EQUIPMENT REPAIR                00014170
0101  0000000102  0000000103  0000000104  0110000105  0930000106  05300000014180
0107  0450000108  0000000109  0000000110  0000000111  0160000112  09500000014190
0113  0000000114  0000000115  0800000116  0800000117  0050000118  02100000014200
0119  0000000120  0270000201  0000000202  0000000203  0100000204  00000000014210
0205  0000000206  0000000207  0000000208  0000000209  0000000210  00000000014220
0211  0000000212  0130000213  0000000214  0060000215  0230000216  02800000014230
0217  0150000218  0000000219  0000000220  0000000221  0000000222  00000000014240
0223  0000000224  0080000301  0000000302  0000000303  0000000304  01300000014250
0305  0000000306  0000000307  0000000308  0000000309  0000000310  00000000014260
0311  0000000312  0000000313  0530000401  0710000402  0200000403  02400000014270
0404  0730000405  0310000406  0000000407  0150000408  0270000409  01800000014280
0410  0080000411  0170000412  0070000413  0000000414  0210000415  00000000014290
0416  0000000417  0000000418  0000000419  0200000420  0200000421  02000000014300
0422  0200000423  0200000424  0200000425  0000000426  0000000427  00000000014310
0428  0190000429  0190000430  0190000431  0190000432  0230000501  00000000014320
0502  0120000503  0000000504  0000000505  0000000506  0000000507  00400000014330
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 568   010000001   000000602   0040000603   0000000604   0260000605   08300000014340
 600   000000607   0050000608   0900000009   0350000610   0000000611   00000000014350
 612   0050000615   0000000614   0160000015   000000616   0000000617   00000000014360
 616   0100000619   0000000620   000000021   0140000022   0070000623   01700000014370
 701   0000000702   0000000703   0100000704   0030000705   0000000706   01400000014380
 707   0520000708   0000000709   0130000710   0000000711   0200000712   00900000014390
 713   0000000714   0000000715   0080000716   0000000717   0000000718   00000000014400
 719   0020000720   0030000721   0000000722   0110000801   0000000802   00000000014410
 803   0200000804   0020000805   0030000901   0060000902   0020000903   00000000014420
 904   0000000905   0000000906   0000000907   0000000908   0000000909   00000000014430
 910   0000000911   0000000912   0000000913   0000000914   0000000915   00000000014440
 916   0140001001   0900001002   0000001003   0100001004   0070001005   02800000014450
1006   0730001007   0130001008   0000001009   0000001010   0150001011   04000000014460
1101   0100001102   0140001103   0140001104   0400001105   0000001106   01000000014470
1107   0000001108   0000001109   0000001110   0000001111   0060001112   00800000014480
1113   0070001201   0130001202   0000001203   0000001204   0090001205   02400000014490
1301   0000001302   0000001303   0000001304   0150001305   0000001306   00500000014500
1307   0100001306   0100001401   0000001402   0000001403   0000001404   01000000014510
1405   0000001406   0000001407   0000001408   0000001409   0000001410   00000000014520
1411   0130001501   0040001502   0200001503   0150001504   0070001505   00500000014530
1506   0000001507   0000001508   0150001509   0000001510   0300001511   00300000014540
1512   0000001513   0050001514   0000001515   0000001516   0000001517   01100000014550
1518   0100001519   0150001520   0080001521   0000001522   0060001523   00200000014560
1524   0080001525   0030001526   0110001601   0040001602   0050001603   00000000014570
1604   0120001605   0090001606   0130001607   0110001608   0150001609   00000000014580
1610   0100001611   0000001612   0000001613   0600001614   0000001615   02100000014590
1701   0150001702   0000001703   0000001704   0050001705   0000001706   00300000014600
1707   0040001708   0000001709   0040001710   0000001711   0060001712   01500000014610
1713   0000001714   0080001801   0150001802   0000001803   0050001804   00000000014620
1805   0200001806   0000001807   0050001901   0000001902   0000001903   01100000014630
1904   0000001905   0000001906   0040001907   0080001908   0050001909   00500000014640
1910   0310001911   0310001912   0120001913   0120001914   0000001915   04500000014650
2001   0060002002   0000002003   0100002004   0070002005   0150002006   01200000014660
2007   0180002008   011000                                               00014670
 54   FUNCTION   FN46,L29(   MPR ON-EQUIP RPR 2NDARY WC, PRIMARY WC   00014680
0101   0000000102   0000000103   0000000104   0000100105   0007100106   00091000014690
0107   0006100108   0000000109   0000000110   0000000111   0000100112   00011100014700
0113   0000000114   0000000115   0010100116   0010100117   0000100118   00001000014710
0119   0000000120   0010040201   0000000202   0000000203   0000100204   00000000014720
0205   0000000206   0000000207   0000000208   0000000209   0000000210   00000000014730
0211   0000000212   0000100213   0000000214   0000100215   0000100216   00200200014740
0217   0000200218   0000000219   0000000220   0000000221   0000000222   00000000014750
0223   0000000224   0000120301   0000000302   0000000303   0000000304   00001000014760
0305   0000000306   0000000307   0000000308   0000000309   0000000310   00000000014770
0311   0000000312   0000000313   0001130401   0009190402   0000200403   00051300014780
0404   0001140405   0003150406   0000000407   0001100408   0001170409   00001000014790
0410   0004140411   0009100412   0000200413   0000000414   0001100415   00000000014800
0416   0000000417   0000000418   0000000419   0000100420   0000100421   00001000014810
0422   0000100423   0000100424   0000100425   0000000426   0000000427   00000000014820
0428   0004060429   0004060430   0004060431   0004060432   0002140501   00000000014830
0502   0000200503   0000000504   0000000505   0000000506   0000000507   00000400014840
0508   0002130601   0000000602   0000100603   0000000604   0001160605   00081200014850
0606   0000000607   0000100608   0000200609   0003070610   0000000611   00000000014860
0612   0000100613   0000000614   0002100615   0800000616   0000000617   00000000014870
0618   0003090619   0000000620   0000000621   0001090622   0000190623   00021300014880
0701   0000000702   0000000703   0000100704   0000100705   0000000706   00061000014890
0707   0006120708   0000000709   0002110710   0000000711   0000100712   00060800014900
0713   0000000714   0000000715   0000100716   0000000717   0000000718   00000000014910
0719   0000100720   0000100721   0000000722   0005080801   0000000802   00000000014920
0803   0000100804   0000100805   0000100901   0002080902   0000100903   00000000014930
0904   0000000905   0000000906   0000000907   0000000908   0000000909   00000000014940
0910   0000000911   0000000912   0000000913   0000000914   0000000915   00000000014950
0916   0001111001   0004061002   0000001003   0005101004   0000101005   00020800014960
1006   0001091007   0018081008   0000001009   0000001010   0000101011   00030800014970
1101   0001091102   0004071103   0000191104   0000201105   0000001106   00030700014980
1107   0000001108   0000001109   0000001110   0000001111   0000201112   00001000014990
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1113    0004091201    0008031202    0000001203    0000001204    0000101205    00010900015000
1301    0000001302    0000001303    0000000304    0000101305    0000001306    00001000015010
1307    0000101308    0008031401    0000001402    0000001403    0000001404    00002000015020
1405    0000001406    0000001407    0000001408    0000001409    0000001410    00000000015030
1411    0002101501    0000301502    0000101503    0000101504    0000101505    00001000015040
1506    0000001507    0000001508    0000101509    0000001510    0000161511    00001000015050
1512    0000001513    0005151514    0000001515    0000001516    0000001517    00001000015060
1518    0000101519    0003131520    0005051521    0000001522    0000101523    00001000015070
1524    0004081525    0000101526    0008031601    0000101602    0000101603    00000000015080
1604    0000111605    0000181606    0000101607    0000101608    0000101609    00000000015090
1610    0000101611    0000001612    0000001613    0000101614    0000001615    00001200015100
1701    0007031702    0000001703    0000001704    0000101705    0000001706    00001000015110
1707    0000101708    0000001709    0000101710    0000001711    0006041712    00001000015120
1713    0000001714    0000101801    0000101802    0000001803    0000101804    00000000015130
1805    0000101806    0000001807    0000101901    0000001902    0000001903    00001000015140
1904    0000001905    0000001906    0003071907    0004191908    0015051909    00150500015150
1910    0010031911    0010031912    0003191913    0002091914    0000001915    00050800015160
2001    0000102002    0000002003    0000102004    0003142005    0000202006    00020800015170
2007    0000172008    000509                                                  00015180
  55     FUNCTION    P1,E3                                                     00015190
1       V136   2     V137   3     V52                                          00015200
*                                                                             00015210
  56     FUNCTION    RN1,D6        PROB MULT MA/MA PMI                         00015220
0.67891       0.92692       0.98713       0.99824       0.99985       0.99996  00015230
*                                                                             00015240
*                                                                             00015250
  57     FUNCTION    RN1,D19       PROB SYSTEM MA PMI/MA PMI                   00015260
0.064501      0.164002      0.281203      0.441304      0.543806      0.594507 00015270
0.597008      0.651709      0.652710      0.671911      0.725112      0.727113 00015280
0.740414      0.792115      0.805916      0.815317      0.817818      0.974919 00015290
0.999920                                                                       00015300
*                                                                             00015310
*                                                                             00015320
  58     FUNCTION    FN46,L296     PROB ELEMENT MA    P M I    /SYS MA   P M I 00015330
0101    000   0102   000   0103   000   0104   000   0105   000   0106   000   00015340
0107    076   0108   000   0109   091   0110   091   0111   000   0112   038   00015350
0113    015   0114   015   0115   015   0116   000   0117   000   0118   000   00015360
0119    036   0120   618   0201   000   0202   000   0203   050   0204   040   00015370
0205    099   0206   000   0207   000   0208   050   0209   000   0210   000   00015380
0211    079   0212   000   0213   000   0214   000   0215   000   0216   000   00015390
0217    000   0218   000   0219   074   0220   074   0221   149   0222   099   00015400
0223    050   0224   238   0301   042   0302   000   0303   000   0304   000   00015410
0305    021   0306   000   0307   021   0308   000   0309   042   0310   042   00015420
0311    084   0312   033   0313   714   0401   138   0402   000   0403   000   00015430
0404    000   0405   000   0406   000   0407   000   0408   043   0409   031   00015440
0410    142   0411   000   0412   000   0413   000   0414   000   0415   092   00015450
0416    000   0417   000   0418   000   0419   021   0420   021   0421   021   00015460
0422    021   0423   021   0424   021   0425   000   0426   000   0427   000   00015470
0428    017   0429   017   0430   017   0431   017   0432   363   0501   000   00015480
0502    000   0503   000   0504   000   0505   000   0506   000   0507   000   00015490
0508    000   0601   106   0602   000   0603   000   0604   096   0605   000   00015500
0606    000   0607   000   0608   000   0609   000   0610   000   0611   000   00015510
0612    063   0613   000   0614   000   0615   000   0616   010   0617   000   00015520
0618    000   0619   000   0620   063   0621   106   0622   063   0623   495   00015530
0701    000   0702   000   0703   000   0704   097   0705   000   0706   330   00015540
0707    019   0708   000   0709   000   0710   000   0711   000   0712   437   00015550
0713    000   0714   078   0715   000   0716   000   0717   019   0718   000   00015560
0719    000   0720   019   0721   000   0722   000   0801   999   0802   000   00015570
0803    000   0804   000   0805   000   0901   000   0902   000   0903   000   00015580
0904    018   0905   000   0906   000   0907   000   0908   000   0909   000   00015590
0910    144   0911   523   0912   000   0913   000   0914   000   0915   027   00015600
0916    288   1001   000   1002   000   1003   000   1004   000   1005   000   00015610
1006    000   1007   999   1008   000   1009   000   1010   000   1011   000   00015620
1101    000   1102   000   1103   000   1104   000   1105   000   1106   000   00015630
1107    000   1108   256   1109   000   1110   000   1111   000   1112   000   00015640
1113    744   1201   555   1202   185   1203   213   1204   046   1205   000   00015650
```

1301	000	1302	000	1303	000	1304	000	1305	500	1306	000	00015660
1307	500	1308	000	1401	185	1402	000	1403	000	1404	000	00015670
1405	165	1406	444	1407	000	1408	000	1409	185	1410	000	00015680
1411	000	1501	000	1502	000	1503	019	1504	095	1505	000	00015690
1506	000	1507	000	1508	000	1509	000	1510	095	1511	000	00015700
1512	000	1513	000	1514	000	1515	048	1516	095	1517	000	00015710
1518	019	1519	000	1520	000	1521	019	1522	048	1523	000	00015720
1524	000	1525	000	1526	562	1601	000	1602	536	1603	000	00015730
1604	179	1605	000	1606	071	1607	000	1608	000	1609	071	00015740
1610	071	1611	000	1612	000	1613	071	1614	000	1615	000	00015750
1701	000	1702	000	1703	000	1704	000	1705	000	1706	000	00015760
1707	000	1708	000	1709	000	1710	105	1711	105	1712	000	00015770
1713	000	1714	789	1801	000	1802	000	1803	000	1804	999	00015780
1805	000	1806	000	1807	000	1901	107	1902	197	1903	000	00015790
1904	323	1905	000	1906	000	1907	031	1908	000	1909	000	00015800
1910	024	1911	024	1912	000	1913	000	1914	000	1915	295	00015810
2001	588	2002	137	2003	000	2004	000	2005	000	2006	039	00015820
2007	235	2008	000									00015830

70 FUNCTION FN46,L296 SKILL CODE —WORK CENTER— REMOVE & REPLACE 00015840

0101	0000030102	0002030103	0007030104	0007030105	0000000106	00000000015850
0107	0000000108	0000070109	0007030110	0007030111	0000000112	00000000015860
0113	0000030114	0000030115	0000000116	0000000117	0007050118	00000000015870
0119	0000030120	0007030201	0000030202	0003020203	0000000204	00000300015880
0205	0003020206	0000030207	0002030208	0002030209	0000030210	00010300015890
0211	0005030212	0002030213	0000050214	0005030215	0002050216	00020300015900
0217	0000030218	0000030219	0002030220	0000030221	0000030222	00000300015910
0223	0010030224	0002030301	0000030302	0000040303	0000030304	00000300015920
0305	0000030306	0000030307	0000030308	0000030309	0000030310	00030200015930
0311	0002030312	0000030313	0010030401	0001030402	0000000403	00000000015940
0404	0001030405	0000030406	0000030407	0001030408	0000030409	00000300015950
0410	0006030411	0006030412	0000030413	0001030414	0000030415	00000300015960
0416	0000030417	0000030418	0000030419	0002030420	0002030421	00020300015970
0422	0002030423	0002030424	0002030425	0007030426	0005030427	00020300015980
0428	0007030429	0007030430	0007030431	0007030432	0002030501	00020300015990
0502	0000030503	0002030504	0000030505	0000020506	0002030507	00020300016000
0508	0005030601	0006030602	0006030603	0002030604	0009030605	00000300016010
0606	0000030607	0000030608	0001030609	0000030610	0000030611	00000300016020
0612	0000030613	0000030614	0009030615	0000030616	0000030617	00000300016030
0618	0008030619	0002080620	0002030621	0007030622	0006030623	00060300016040
0701	0009030702	0009030703	0000030704	0009030705	0002030706	00020300016050
0707	0000000708	0003090709	0009030710	0003090711	0009030712	00030900016060
0713	0005030714	0005030715	0000020716	0000030717	0000030718	00000300016070
0719	0000030720	0000030721	0000030722	0003090801	0008020802	00080300016080
0803	0002030804	0009030805	0007030901	0002080902	0000080903	00000800016090
0904	0000030905	0003080906	0008030907	0000080908	0003080909	00030800016100
0910	0002030911	0003080912	0003080913	0003080914	0000020915	00000800016110
0916	0008031001	0000001002	0001031003	0000031004	0000001005	00010300016120
1006	0000001007	0003041008	0000031009	0000031010	0000001011	00010300016130
1101	0005031102	0000001103	0005031104	0002031105	0005031106	00080300016140
1107	0005081108	0002081109	0000031110	0000031111	0000031112	00000300016150
1113	0005031201	0002031202	0000031203	0003081204	0001031205	00020300016160
1301	0002031302	0000031303	0000031304	0000031305	0000031306	00080400016170
1307	0008041308	0007081401	0000031402	0003081403	0001031404	00080300016180
1405	0000031406	0000031407	0000031408	0000031409	0008031410	00000300016190
1411	0002031501	0008031502	0000081503	0009031504	0002031505	00000400016200
1506	0000041507	0000041508	0000081509	0000081510	0003081511	00080400016210
1512	0001041513	0004031514	0000081515	0000081516	0000071517	00030800016220
1518	0008031519	0009081520	0008031521	0003021522	0001031523	00080300016230
1524	0003081525	0004081526	0003081601	0000041602	0001041603	00020400016240
1604	0000041605	0000041606	0000001607	0000041608	0000041609	00000400016250
1610	0003081611	0000041612	0000041613	0000041614	0000041615	00010400016260
1701	0008031702	0000041703	0001041704	0000041705	0000041706	00000000016270
1707	0003041708	0000041709	0008041710	0008041711	0000011712	00000400016280
1713	0000041714	0008041801	0000041802	0000041803	0008041804	00000400016290
1805	0003041806	0000041807	0000041901	0000031902	0009031903	00090300016300
1904	0003091905	0003081906	0008031907	0001091908	0003091904	00030900016310

```
 1910  0003091911  0003091912  0000001913  0009031914  0009031915  00030900016320
 2001  0009032002  0009032003  00080.32004  0000032005  0000032006  00090200016330
 2007  0007092008  000309                                                  00016340
   71  FUNCTION    P1,E3        VARIABLE SORT FOR WORK CENTERS, RGR        00016350
    1  V270  2     V269  3      V268                                       00016360
       INITIAL     XH76,1566                                              00016370
       INITIAL     MH11(1-4,5),1      MON   ROW=LAUNCH,DATA=PRIORITY      00016380
       INITIAL     MH13(1-5,5),1      ROW=LAUNCH,DATA=PRIORITY            00016400
       INITIAL     MH14(1-4,5),1      THU   ROW=LAUNCH,DATA=PRIORITY      00016410
       INITIAL     MH15(1-4,5),1      FRI   ROW=LAUNCH,DATA=PRIORITY      00016420
       INITIAL     MH11(1,10),1       MON   NO. OF A/C LAUNCH1            00016430
       INITIAL     MH13(1,10),1       WED   NO. OF A/C LAUNCH1            00016450
       INITIAL     MH14(1,10),1       THU   NO. OF A/C LAUNCH1            00016460
       INITIAL     MH15(1,10),1       FRI   NO. OF A/C LAUNCH1            00016470
       INITIAL     MH11(2,10),1       MON   NO. OF A/C LAUNCH2            00016480
       INITIAL     MH13(2,10),1       WED   NO. OF A/C LAUNCH2            00016500
       INITIAL     MH14(2,10),1       THU   NO. OF A/C LAUNCH2            00016510
       INITIAL     MH15(2,10),1       FRI   NO. OF A/C LAUNCH2            00016520
       INITIAL     MH11(3,10),2       MON   NO. OF A/C LAUNCH3            00016530
       INITIAL     MH13(3,10),1       WED   NO. OF A/C LAUNCH3            00016550
       INITIAL     MH14(3,10),2       THU   NO. OF A/C LUANCH3            00016560
       INITIAL     MH15(3,10),1       FRI   NO. OF A/C LAUNCH3            00016570
       INITIAL     MH11(4,10),1       MON   NO. OF A/C LAUNCH4            00016580
       INITIAL     MH13(4,10),2       WED   NO. OF A/C LAUNCH4            00016600
       INITIAL     MH14(4,10),1       THU   NO. OF A/C LAUNCH4            00016610
       INITIAL     MH15(4,10),1       FRI   NO. OF A/C LAUNCH4            00016620
       INITIAL     MH13(5,10),1       WED   NO. OF A/C LAUNCH5            00016625
       INITIAL     MH11(1,11),88      MON   TIME FROM 00:12 TO 1ST LAUNCH 00016630
       INITIAL     MH13(1,11),88      WED   TIME FROM 00:12 TO 1ST LAUNCH 00016650
       INITIAL     MH14(1,11),88      THU   TIME FROM 00:12 TO 1ST LAUNCH 00016660
       INITIAL     MH15(1,11),88      FRI   TIME FROM 00:12 TO 1ST LAUNCH 00016670
       INITIAL     MH11(2,11),5       MON   TIME BETWEEN LAUNCH 1&2      00016680
       INITIAL     MH13(2,11),1       WED  TIME BETWEEN LAUNCH 1&2       00016700
       INITIAL     MH14(2,11),5       THU   TIME BETWEEN LAUNCH 1&2      00016710
       INITIAL     MH15(2,11),5       FRI   TIME BETWEEN LAUNCH 1&2      00016720
       INITIAL     MH11(3,11),20      MON   TIME BETWEEN LAUNCH 2&3      00016730
       INITIAL     MH13(3,11),4       WED  TIME BETWEEN LAUNCH 2&3       00016750
       INITIAL     MH14(3,11),20      THU   TIME BETWEEN LAUNCH 2&3      00016760
       INITIAL     MH15(3,11),20      FRI   TIME BETWEEN LAUNCH 2&3      00016770
       INITIAL     MH11(4,11),20      MON   TIME BETWEEN LAUNCH 3&4      00016780
       INITIAL     MH13(4,11),20      WED  TIME BETWEEN LAUNCH 3&4       00016800
       INITIAL     MH14(4,11),20      THU   TIME BETWEEN LAUNCH 3&4      00016810
       INITIAL     MH15(4,11),20      FRI   TIME BETWEEN LAUNCH 3&4      00016820
       INITIAL     MH13(5,11),20      WED  TIME BETWEEN LAUNCH 4&5       00016825
       INITIAL     MH11(2,12),107     MON   TIME BETWEEN LAUNCH 4&00:12  00016830
       INITIAL     MH13(2,12),107     WED   TIME BETWEEN LAUNCH 4&00:12  00016850
       INITIAL     MH14(2,12),107     THU   TIME BETWEEN LAUNCH 3&00:12  00016860
       INITIAL     MH15(2,12),107     FRI   TIME BETWEEN LAUNCH 4&00:12  00016870
       INITIAL     MH11(1,12),4       MON   NO. OF LAUNCHES PER DAY      00016880
       INITIAL     MH13(1,12),5       WED   NO. OF LAUNCHES              00016900
       INITIAL     MH14(1,12),4       THU   NO. OF LAUNCHES PER DAY      00016910
       INITIAL     MH15(1,12),4       FRI   NO. OF LAUNCHES PER DAY      00016920
       INITIAL     MH1(1,13),480      NON FLYING HOURS WEEKEND          00016930
       INITIAL     MH1(1,14),1200     FLYING HOURS WEEKDAYS             00016940
       INITIAL     MH1(3,12),5        SLACK TIME                        00016950
       INITIAL     MH1(8,12),14        TIME FROM CALL TO LAUNCH         00016960
       INITIAL     MH1(6,13),0        TIME TO PERFORM AIRCREW INSPECTION 00016970
       INITIAL     MH1(7,13),5        LAUNCH TIME TO REPLACE ABORTS      00016980
       INITIAL     MH1(1,17),999      PERCENT IN-FLT ABORTS REPLACED     00016990
       INITIAL     MH1(1,15),1        NO STANDBY A/C BY MISSION TYPE     00017000
       INITIAL     MH1(1,18),18        FLT DURATION FOR ABORT REPLACEMENTS00017010
       INITIAL     MH1(1,16),2        NO.PRELAUNCH EVENTS                00017020
       INITIAL     MH1(1,21),5        TIME LAUNCH WINDOW STAYS OPEN      00017030
       INITIAL     MH1(1,15),1        STANDBY AIRCRAFT MISSION 1         00017040
       INITIAL     MH1(2,16),2            PRELAUNCH EVENTS               00017050
       INITIAL     MH1(6,17),1200     5 DAY FLYING PERIOD                00017060
```

CH-54B MODEL PROGRAM UPDATE AND PROGRAM LISTING
WITH NECESSARY MODIFICATIONS TO THE
GOVERNMENT-FURNISHED MODEL IDENTIFIED

PROGRAM UPDATE FOR THE CH-54B MODEL

The program update for the CH-54B model is contained in this Appendix. This update contains the reasons for all Sikorsky-initiated changes. Eustis Directorate initiated some changes to improve the overall model, and these changes are noted without comment. Certain specific changes made by Sikorsky are of particular significance and are elaborated on below.

Incorporation of Log Normal Distribution

The log normal distribution has been incorporated into the CH-54B baseline simulation model to replace the exponential distribution previously contained in the simulation model input function 36. The log normal (to the Base e) is more representative of the replacement and repair elapsed maintenance time distributions evidenced by the CH-54B. Contained in figure 7 are graphs comparing the two distributions followed by pertinent facts about the log normal distribution used for CH-54B simulation runs.
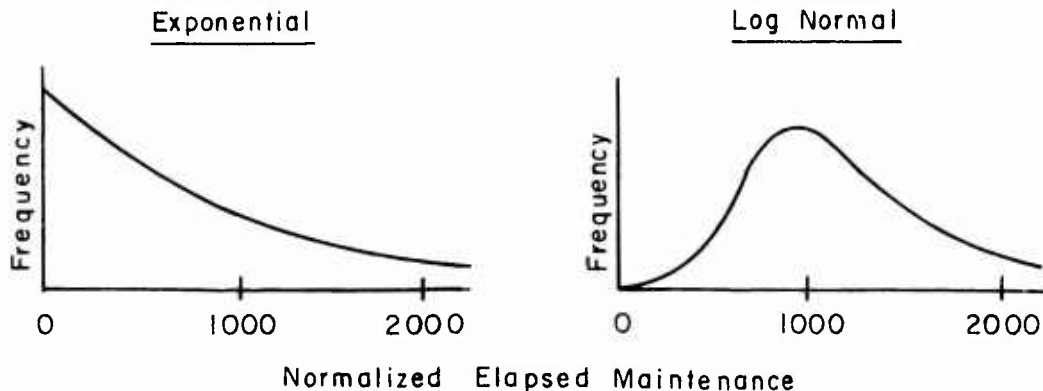
Figure 7. Alternative Elapsed Maintenance Time Distributions

The elapsed maintenance time distributions of eight different CH-54B components were studied to ascertain the most appropriate distribution for the CH-54B. The eight components were singled out because they contained the most data. The shape of the observed distributions dictated that the log normal be used instead of the exponential distribution. Therefore, the exponential distribution with mean = 1000 was replaced by the log normal distribution with mean = 1000. The log normal distribution, which was found to best represent the eight observed distributions, reflected the following log values:

θ = Mean of the natural log of the variable   x = 6.784
σ^2 = Variance of the natural log of the variable x = .25

TBO Initialization

The CH-54B R&M model reflects that components reaching their TBO times are replaced with components having their full TBO time remaining. The simulation runs bear out the adequacy of present logic. Based on the TBO component scheduled removal times as defined under "CH-54B Aircraft Description", the removal rate for all scheduled TBO replacements should approximate 17 scheduled removals/1000 flight hours. The slightly higher value results from the interaction of the initialized component times and the first preventive maintenance periodic (PMP) inspection. Because of the 100 flight hour duration between PMP's, components having less than 100 hours remaining before TBO expiration are replaced. This results in a slightly higher rate of replacement. This, however, is consistent with procedures practiced in the field.

Modified Daily Inspection Schedule

The daily inspection subroutine has been modified to eliminate the possibility of daily inspections being performed on overtime hours. This was in compliance with an Army request. This modification resulted in a less flexible daily flight schedule, since all flying and daily inspections as well as preflights had to be packed into the 8-hour operational day.

CH-54B MODEL PROGRAM LISTING WITH NECESSARY MODIFICATION TO THE GOVERNMENT-FURNISHED MODEL IDENTIFIED

The following is a list of changes made to the Government-furnished model to convert the UH-1N R&M model to conform to CH-54B aircraft and operational characteristics. Changes made by the Government to update the original UH-1N R&M model are so noted with no further comment.

1. The change in the reallocation of functions, variables, full-word save-values, and transactions was necessary to reapportion the allocation of entities in the model to accommodate changes to simulate CH-54B operation.

2. Variable 9 has been corrected to allow general use of the variable as well as inclusion of a snap feature.

3. Variable 19 has been modified to be general with respect to the start of the first shift.

4. Variable 38 has been generalized with respect to the end of the first shift.

5. Per a Eustis Directorate correction, variable 73 is now correct.

6. Variable 233 has been added per Eustis Directorate directive.

7. Variable 238 has been added per Eustis Directorate directive.

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8. Variables 268, 269, 270 have been added to provide different centers for remove and replace actions. These variables decode the "packed" information contained in function 70.

9. Variable 267 was added to accommodate the scheduling of launch calls on a daily basis. This variable will define the half matrix to be used for that particular day's launches.

10. Boolean variable 11 has been changed per Eustis Directorate.

11. Boolean variable 19 has been changed per Eustis Directorate.

12. Half matrices 11-17 have been added for the daily launch schedule. Half matrix 11 is Monday's launches and matrix 17 is Sunday's.

13. Table 9 has been changed to give a more meaningful output of downtime distribution for the CH-54B.

14. Table 18 has been added to tabulate the start of each daily inspection.

15. Table 19 has been added to tabulate the number of deferred maintenance actions caused by the aircraft at the start of the daily inspection.

16. Storages 33 through 42 have been limited to the levels defined by the CH-54B TOE.

17. The PMI has been added to function 7 (event code 8).

18. Function 15 has been modified to identify function 57 for the system failure for PMI.

19. Function 23 has been modified to identify function 58 for the element failure for PMI.

20. The log normal distribution has been substituted for the exponential distribution.

21. Function 40 has been redefined as the skill codes (or work centers) for on-aircraft repair only. It was formerly the skill codes for on-aircraft repair as well as remove and replace.

22. Function 48 has been redefined as the probability of no cannibalization given a NORS item.

23. Function 58 has been added to define the probability of element failure given system failure during PMI.

24. Function 70 has been added to define separate work centers for remove and replace actions.

25. Function 71 has been added to use variables 268, 269, and 270 to decode the data contained in function 70.

26. In order to define the daily flight schedule in half matrices 1 through 17, these initial statements have been added. The structure is defined such that the rows and columns contain the data in the same matrix location as half matrix 1 formerly contained. Data other than flight schedule data is still retained in half matrix 1.

27. These initial statements were added per Eustis Directorate.

28. This initial statement defines save-value 1601 as the time of the end of first shift. It is used in variable 38.

29. These model logic changes were added to define a flight schedule on a daily basis.

30. Changed per Eustis Directorate.

31. Number of TBO items to be initialized has been generalized.

32. Added per Eustis Directorate.

33. Added per Eustis Directorate.

34. Added per Eustis Directorate.

35. Added per Eustis Directorate.

36. Table 18 added to tabulate time daily performed.

37. Table 19 added to tabulate number of deferred maintenance actions carried at the start of the daily inspection.

38. Added per Eustis Directorate.

39. Added per Eustis Directorate.

40. Added per Eustis Directorate.

41. Added per Eustis Directorate.

42. Corrected per Eustis Directorate.

43. Added to insure that if the item is a remove and replace action 100% of the time, and if the random number comes up as 999, it still will be a remove and replace action.

44. Changed to be consistent with the definition of function 38 being probability of part availability.

45. Logic change to assign remove and replace work centers from function 70 and on-aircraft repair work centers from function 40.

46. Removed truncation of elapsed maintenance times. With the use of the log normal distribution of repair times in place of exponential, truncation of the distribution was not necessary.

47. Added per Eustis Directorate.

48. Removed the test to put test hops in the second shift. The CH-54B is a one-shift operation.

49. The CH-54B baseline requires a .650 value in this statement to get the proper percentage of test hop flight time.

50. Changed per Eustis Directorate.

51. Added to require secondary work centers for cannibalization remove and replace actions when needed.

52. Untruncated cannibalization remove and replace time to correspond with CH-54B data.

53. Added per Eustis Directorate.

54. Report changed to more clearly output CH-54B simulated operational statistics.

```
            REALLOCATE   BLO,1450                                      CCOOOO1C
            REALLOCATE   STO,90                                        00000020
            REALLOCATE   QUE,70                                        0000003C
            REALLOCATE   LOG,40                                        CCOOOO4C
            REALLOCATE   FUN,60                                        00000050
            REALLOCATE   TAB,20                                        00000060
            REALLOCATE   LVR,20                                        00000070
            REALLOCATE   VAR,270                                       CCOOOO8U
            REALLOCATE   FSV,1750                                      00000090
            REALLOCATE   HSV,90                                        00000100
            REALLOCATE   CHA,60                                        00000110
            REALLOCATE   GRP,70                                        00000120
            REALLOCATE   FMS,5                                         00000130
            REALLOCATE   HMS,20                                        00000140
            REALLOCATE   XAC,400                                       00000150
            REALLOCATE   COM,175000                                    00000160
            SIMULATE     30                                            80000170
            UNLIST       ABS                                           0C000180
     1      VARIABLE     P2+K5    MISSION MATRIX COLUMN NUMBERS        00000190
     2      VARIABLE     P11+K5   MISSION MATRIX NUMBERS               00000200
     3      VARIABLE     P11+K8   "MISSION FLYING HOUR GOAL" SWITCH NUMBERS    00000210
     4      VARIABLE     P11+K11  "MISSION FLYING HOURS" SAVEVALUE NUMBERS     00000220
     5      VARIABLE     P4+K5 "AIRCRAFT NOT AVAILABLE WHEN CALLED" MISSION XH  0000023U
     6      VARIABLE     P4+K3 "MISSION LAUNCH GATE" SWITCH NUMBERS    C0000240
     7      VARIABLE     P11+K13 "MISSION CYCLIC FLYING HOUR" SWITCH NUMBERS   00000250
     8      VARIABLE     P4+K13 "MISSION CYCLIC FLYING HOUR" SWITCH NUMBERS    000CO260
     9      VARIABLE     P3-C1       CORRECTED    11.5.74              C0000270
     10     VARIABLE     (RN1*1000+RN1)@X195   INITIAL DAYS SINCE PMP  00000280
     11     VARIABLE     (P47+(C1/240))@X195   DAYS SINCE PMP          U000C290
     13     VARIABLE     RN1*1000+RN1 SIX DIGIT RANDOM NUMBER          00000300
     14     VARIABLE     P8+K3  MISSION STORE + LAUNCH GATE SWITCH NUMBERS  00000310
     15     VARIABLE     P8+K13 "MISSION CYCLIC FLYING HOUR" SWITCH NUMBERS 00000320
     16     VARIABLE     P8+K18   NUMBER OF EACH MISSION FLOWN WITHOUT MA'S  00000330
     17     VARIABLE     P8+K24   SAVEVALUE NUMBERS - FLIGHT HOURS BY MISSION  00000340
     18     VARIABLE     FN4/2   ABORT FLIGHT TIME DURATION            00000350
     19     VARIABLE     (MX3(3,4)+240-V20)@240 TIME TO START OF 1ST SHIFT  C0000360
     20     VARIABLE     C1@240   TIME OF DAY-TENTHS OF HOURS          00000370
     21     VARIABLE     P14@MX1(1,10)  0=TIME FOR ALTERNATE DAILY     00000380
     23     VARIABLE     FN6/10000  MANPOWER REQUIRED                  00000390
     24     VARIABLE     FN6@100@100  WORK CENTER                      00000400
     25     VARIABLE     FN6@100  MEAN ELAPSED TIME TO PERFORM EVENT   00000410
     26     VARIABLE     P17+8    EVENT STORE NUMBER                   00000420
     27     VARIABLE     P2+32   WORK CENTER QUEUE + 1ST SHIFT STORE NUMBERS  00000430
     28     VARIABLE     P2+43   2ND SHIFT WORK CENTER STORE NUMBER    00000440
     29     VARIABLE     P22*P20  MAN HOURS X 1.00                     00000450
     30     VARIABLE     P2+8   SAVEVALUE NUMBERS OF MMH VS. WORK CENTER  00000460
     31     VARIABLE     P2+43-P4*11  SKILL LINK NUMBERS               00000470
     32     VARIABLE     8+BV14   MATRIX COLUMN NUMBER-PMP/PMI ELAPSE TIME  00000480
     33     VARIABLE     K2+BV14*8   MATRIX ROW NUMBER-PMP OR PMI,MEN  00000490
     34     VARIABLE     K3+BV14*6   MATRIX ROW NUMBER-PMP OR PMI,TIME/MAN  00000500
     35     VARIABLE     220-C1@240   TIME REMAINING SECOND SHIFT      00000510
     36     VARIABLE     P3*P4   MAN HOURS X 100                       00000520
     37     VARIABLE     P2+20   SAVEVALUE NUMBERS-PMP/PMI MAN HOURS BY WORK CEN 00000530
     38     VARIABLE     X1601-C1@240   TIME REMAINING - FIRST SHIFT   00000540
     39     VARIABLE     P4-P20   EMT IN EXCESS OF CURRENT SHIFT LENGTH  00000550
     40     VARIABLE     P2+29  SAVEVALUE NUMBERS, NUMBER OF P2 MA'S/EVENT  00000560
     41     VARIABLE     P19+39  SAVEVALUE NUMBERS, NUMBER OF MA'S/P19 EVENT  00000570
     42     VARIABLE     P3*100+P5  ELEMENT NUMBER                     00000580
     45     VARIABLE     FN37/K1000  PROBABILITY OF R + R              00000590
     46     VARIABLE     P22/100  ELEMENT SYSTEM NUMBER                00000600
     47     VARIABLE     P1+25  PARAMETER IDENTIFICATION - WORK CENTER  00000610
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48	VARIABLE	FN4C/1000 DS/GS WORK CENTER	00000620
49	VARIABLE	FN40@10000/100 ORGANIZATIONAL SECONDARY WORK CENTER	00000630
50	VARIABLE	FN40@100 ORGANIZATIONAL PRIMARY WORK CENTER	00000640
51	VARIABLE	P1+2D PARAMETER IDENTIFICATION - M.P.	00000650
52	VARIABLE	FN42/1000 DS/GS MANPOWER (M.P.)	00000660
53	VARIABLE	FN42@10000/100 ORGANIZATIONAL SECONDARY M.P.	00000670
54	VARIABLE	FN42@100 ORGANIZATIONAL PRIMARY M.P.	00000680
55	VARIABLE	KC+(FN43@1000*FN36+500)/1000 MEMT - R + K	00000690
56	VARIABLE	P4*10 UNITS CONVERSION	00000700
57	VARIABLE	(MX1(4,5)*FN36+500)/1000 MEAN GSE DELAY TIME	00000710
58	VARIABLE	P2+37 SAVEVALUE NUMBERS-UNSCHEDULED MMH BY WORK CENTER	00000720
59	VARIABLE	1+6V4 MATRIX COLUMN IDENTIFICATION	00000730
60	VARIABLE	M1*K10 UNITS CONVERSION	00000740
61	FVARIABLE	FN45*(1+(X1602/100)) SUPPLY DELAY	00000750
62	VARIABLE	NSNCRD-NSNORW NORS TEST VALUE	00000760
63	VARIABLE	P2+K49 SAVEVALUE NUMBERS-CANNIBALIZATION MMH BY WORK	00000770
64	VARIABLE	P1+C1 TIME WHEN PART BECOMES AVAILABLE	00000780
65	VARIABLE	(FN43/1000+FN36+K500)/1000 OFF-EQUIPMENT RPR MEMT	00000790
66	VARIABLE	FN43/1000 OFF-EQUIPMENT REPAIR TIME	00000800
67	VARIABLE	P28+K66 STORES INDEX FOR GS WORK CENTERS	00000810
68	VARIABLE	P28+K45 QUEUE INDEX FOR GS WORK CENTERS	00000820
69	VARIABLE	P28+K63 SAVEVALUE NUMBERS FOR WORK CENTER TOTAL MMH'S	00000830
70	VARIABLE	P31*P4 MAN HOURS X 100	00000840
71	VARIABLE	FN37@K1000 PERCENT ELEMENTS REPAIRED @ GS	00000850
72	VARIABLE	FN47/1000 PERCENT ELEMENTS NRTS (1-8) A GS	00000860
73	VARIABLE	FN47@1000 PERCENT ELEMENTS NRTS (9) @ GS	00000870
74	VARIABLE	P3+MX3(*2,4)-C1 DELAY TIME IN MPC/SHIFT ROUTINE	00000880
75	VARIABLE	P6-R*1 NUMBER OF MEN STILL REQUIRED	00000890
77	VARIABLE	P4+43 SECOND SHIFT WORK CENTER CHAIN/STORE INDEX	00000900
78	VARIABLE	P4+32 FIRST SHIFT WORK CENTER CHAIN/STORE INDEX	00000910
79	VARIABLE	P3+P5 TIME INTERVAL	00000920
80	VARIABLE	P2+K4+4(K3-P14) MANPOWER REDUCTION MATRIX INDEX	00000930
81	VARIABLE	K21+P4+K11(K3-P14) MANPOWER CONTROL CHAIN/STORE INDEX	00000940
82	VARIABLE	P5-C1@P3 MANPOWER REDUCTION CONTROL TIME	00000950
83	VARIABLE	P6-R*7 MANPOWER DIFFERENCE	00000960
84	VARIABLE	MX1(5,2)+MX1(5,3)+MX1(5,4) MAN HOUR SUMMATION	00000970
135	VARIABLE	FN31/1000 ELEMENT PROBABILITY OF NOR	00000980
136	VARIABLE	FN54@100 MANPOWER - ON EQUIPMENT REPAIR	00000990
137	VARIABLE	FN54/K100 MANPOWER - ON EQUIPMENT REPAIR	00001000
138	VARIABLE	(FN53/1000*FN36+500)/1000 EMET-ON EQUIPMENT REPAIR	00001010
139	VARIABLE	FN52/1000 PROBABILITY OF REPAIR BY IDS	00001020
140	VARIABLE	FN52@1000 PROBABILITY OF REPAIR BY DS	00001030
141	VARIABLE	P28+K77 STORES INDEX FOR DS WORK CENTERS	00001040
142	VARIABLE	P28+56 QUEUE INDEX FOR DS WORK CENTERS	00001050
143	VARIABLE	P28+95 SAVEVALUE NUMBERS FOR WORK CENTERS TOTAL MMH'S	00001060
144	VARIABLE	CH1+WSARM14 AIRCRAFT AVAILABLE NEXT AM	00001070
145	VARIABLE	240-P3-P2 NON-SHIFT HOURS	00001080
146	FVARIABLE	(MH6(26,P15)*RN1/1000)	00001090
*		USE (MH6(16,P15)*RN1/1000) WITH TBD RUN	00001100
147	VARIABLE	P40@X189 GENERAL	00001110
148	VARIABLE	P40@X190 GENERAL	00001120
149	VARIABLE	MH6(P14,P12)*10-P40 TIME-ELEMENT REPLACEMENT DUE	00001130
150	VARIABLE	P40/10+MH6(26,*12) NEXT TIME REPLACEMENT DUE	00001140
151	VARIABLE	P14+K200 SAVE VALUE NO-MISSIONS CALLED EA ACFT/MONTH	00001150
152	VARIABLE	P14+K800 SAVEVALUE NO-MISSIONS CALLED EA ACFT/SIMULA	00001160
153	VARIABLE	P14+K225 SAVEVALUE NO-MISSIONS COMPLETED EA ACFT/MON	00001170
154	VARIABLE	P14+K825 SAVEVALUE NO-MISSIONS COMPLETED EA ACFT/SIM	00001180
155	VARIABLE	P14+K250 SAVEVALUE NO-MISSION FLIGHT HR EA ACFT/MONTH	00001190
156	VARIABLE	P14+K850 SAVEVALUE NO- MISSION FLIGHT HR EA ACFT/SIMU	00001200
157	VARIABLE	P14+K275 SAVEVALUE NO-NUMBER OF PREFLIGHTS EA ACFT/MO	00001210
158	VARIABLE	P14+K875 SAVEVALUE NO-NO OF PREFLIGHTS EA ACFT/SIMU	00001220
159	VARIABLE	P14+K300 SAVEVALUE NO-PREFLIGHT MMH'S X 100 EA ACFT	00001230
160	VARIABLE	P14+K900 SAVEVALUE NO-PREFLIGHT MMH'SX100, EA ACFT/SI	00001240
161	VARIABLE	P14+K325 SAVEVALUE NO-NO OF DAILY'S EA ACFT/MONTH	00001250
162	VARIABLE	P14+K925 SAVEVALUE NO-NO OF DAILY'S, EA ACFT/SIMU	00001260
163	VARIABLE	P14+K350 SAVEVALUE NO-DAILY MMH'SX100, EA ACFT.MONTH	00001270

164	VARIABLE	P14+K550	SAVEVALUE NO-DAILY MMH'SX100, EA ACFT MON	00001280
165	VARIABLE	P14+575	SAVEVALUE NO-PMI'S BY AIRCRAFT S/N / MONTH	00001290
166	VARIABLE	P14+975	SAVEVALUE NO-PMI'S BY ARICRAFT S/N/SIMULATION	00001300
167	VARIABLE	P14+400	SAVEVALUE NO-MONTHLY PMI MAN HR BY ACFT S/N	00001310
168	VARIABLE	P14+1000	SAVEVALUE NO-SIMULATION PMI MAN HR BY ACFT S	00001320
169	VARIABLE	P14+425	SAVEVALUEND-PMP'S BY ACFT S/N/MONTH	00001330
170	VARIABLE	P14+1025	SAVEVALUE NO-PMP'S BY ACFT S/N/SIMULATION	00001340
171	VARIABLE	P14+450	SAVEVALUE NO-PMP MMH BY ACFT S/N/MONTH	00001350
172	VARIABLE	P14+1050	SAVEVALUE NO-PMP MMH BY ACFT S/N/SIMULATION	00001360
173	VARIABLE	P14+475	SAVEVALUE NO-UMA BY ACFT S/N/MONTH	00001370
174	VARIABLE	P14+1075	SAVEVALUE NO-UMA BY ACFT S/N/SIMULATION	00001380
175	VARIABLE	P14+500	SAVEVALUE NO-SMA BY ACFT S/N / MONTH	00001390
176	VARIABLE	P14+1200	SAVEVALUE NO-SMA BY ACFT S/N / SIMULATION	00001400
177	VARIABLE	P5+525	SAVEVALUE NO-SCHEDULED MAINT MH BY ACFT S/N/M	00001410
178	VARIABLE	K300+P5	PARAMETERS 1-4 OFFSET VALUES FOR SAVEVALUE IN	00001420
179	VARIABLE	K350+P5	PARAMETERS 1-4 OFFSET VALUES FOR SAVEVALUE IN	00001430
180	VARIABLE	K400+P5	PARAMETERS 1-4 OFFSET VALUES FOR SAVEVALUE IN	00001440
181	VARIABLE	K450+P5	PARAMETERS 1-4 OFFSET VALUES FOR SAVEVALUE IN	00001450
182	VARIABLE	X*1+X*2+X*3+X*4	SAVEVALUE SUMMATION	00001460
183	VARIABLE	X325+X375+X425+X475	SAVEVALUE SUMMATION	00001470
184	VARIABLE	P14+1175	SAVEVALUE NO-SIMULATION-SCHEDULED MA'S BY AC	00001480
185	VARIABLE	P14+575	SAVEVALUE NO-MONTHLY-SCHEDULED MA'S BY ACFT	00001490
186	VARIABLE	P14+1200	SAVEVALUE NO-SIM ELAPSED UNSCH MAINT ACFT	00001500
187	VARIABLE	P14+600	SAVEVALUE NO-MONTHLY ELAPSED UNSCH MAINT A/C	00001510
188	VARIABLE	P5+1125	SAVEVALUE NO-SIMULATION TOTAL SCHED MAINT MH	00001520
189	VARIABLE	P14+550	SAVEVALUE NO-MONTHLY SCHED MAINT MH BY ACFT	00001530
190	VARIABLE	P14+1150	SAVEVALUE NO-SIMULATION SCHED MAINT MH BY AC	00001540
191	VARIABLE	P20*P22	MAN HOURS X 100	00001550
192	VARIABLE	P14+1225	SAVEVALUE NO-SIMULATION DIR MAINT MH BY ACFT	00001560
193	VARIABLE	K625+P6	SAVEVALUE NO-MONTHLY DIR MAINT MH BY ACFT S	00001570
194	VARIABLE	K1250+P14	SAVEVALUE MO-SIMULATION NORM TIME (.1 HR)	00001580
195	VARIABLE	K650+P14	SAVEVALUE NO-MONTHLY NORM TIME (.1 HR)	00001590
204	VARIABLE	K1350+P14	SAVEVALUE NO-SSIMULATION TEST HOPS BY ACFT	00001600
205	VARIABLE	K750+P14	SAVEVALUE NO-MONTHLY TEST HOPS BY ACFT S/N	00001610
206	VARIABLE	K1375+P14	TEST HOP FLT.HRS SAVE NO.S.-TOTAL	00001620
207	VARIABLE	K775+P14	TEST HOP FLT.HRS SAVE NO.S.-MONTHLY	00001630
208	VARIABLE	K1475+P14	FLT.ABORTS- SAVE NO.S - TOTAL	00001640
209	VARIABLE	K1425+P14	FLT.ABORTS- SAVE NO.S - MONTHLY	00001650
210	VARIABLE	K1500+P14	ABORT FLIGHT HOURS- SAVE NO'S-TOTAL	00001660
211	VARIABLE	K1450+P14	ABORT FLIGHT HOURS- SAVE NO'S-MONTHLY	00001670
212	VARIABLE	(X*1+X*2)*10	SAVEVALUE SUMMATION + UNITS CONVERSION	00001680
213	VARIABLE	P7/(X*3+X*4+X*5)	CONVERSION TO RATIOS	00001690
214	VARIABLE	(X550+X575)*10/(X275+X800+X1475)	AVAIL. CALC.	00001700
215	VARIABLE	X275+X800+X1475	SAVEVALUE SUMMATION	00001710
216	FVARIABLE	(C1-X*1-X*3-X*4)*10000/C1		00001720
217	FVARIABLE	(X191*C1-X675-X1425-X1660-X1750)*10000/(X191*C1)		00001730
218	FVARIABLE	X*1*10000/X*2	ACFT MONTHLY AVAIL PERCENT MISSIONS CUM	00001740
219	FVARIABLE	(X*1+X*2)*10000/X*3	ACFT MONTHLY AVAIL, MISSIONS RAT	00001750
220	FVARIABLE	(X250+X1450)*10000/X225	PLAT.MONTHLY AVAIL-MISS.RATIO	00001760
221	FVARIABLE	X250*10000/X225	PLATOON MONTHLY AVAIL, PERCENT MISS C	00001770
222	VARIABLE	P14+K525	SAVEVALUE NO-MONTHLY SCHED MAINT MH BY ACFT	00001780
223	VARIABLE	P14+K1125	SAVEVALUE NO-SIMULATION SCHED MAINT MH BY AC	00001790
224	VARIABLE	G1+G32+G30+G37		00001800
225	VARIABLE	(G31+G32)*K80		00001810
226	VARIABLE	(G31+G32)*560		00001820
227	VARIABLE	(G30+G37)*K80		00001830
228	VARIABLE	(G30+G37)*K560		00001840
229	FVARIABLE	(XH11/(XH11+(X188/10)))*10000		00001850
230	FVARIABLE	(XH11/(XH11+(X188/10)+X187))*10000		00001860
231	VARIABLE	(RN1*K1000+RN1)aX189		00001870
232	VARIABLE	P14+K1400		00001880
233	VARIABLE	C1-P48		00001890
234	VARIABLE	X189-FN4	GENERAL	00001900
235	VARIABLE	X190-FN4	GENERAL	00001910
236	VARIABLE	X195-X196	PMP CALENDAR	00001920
237	VARIABLE	720-1440		00001930

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	238	VARIABLE	P40-P49		00001940
7	239	VARIABLE	C1-P46		00001950
	240	VARIABLE	P1+325		00001960
	243	VARIABLE	MX1(5,1)-P10		00001961
	244	VARIABLE	1660+P14		00001962
	245	VARIABLE	MX1(5,1)-K2		00001963
	241	VARIABLE	P1+225		00001970
	266	VARIABLE	C1@1680/240	NORA	00001975
	268	VARIABLE	FN70/10000		00001980
8	269	VARIABLE	FN70@10000/100	SEC. W.C. R&R	00001990
	270	VARIABLE	FN70@100	PRI. W.C. R&R	00002000
9	267	VARIABLE	C1@1680/240+11	DAY OF WEEK+10 FOR LAUNCH MATRICES	00002010
	1	BVARIABLE	V20'G'250	DUMMY NO POST FLIGHT	00002020
	2	BVARIABLE	V20'G'250	DUMMY NO RESPOT	00002030
	3	BVARIABLE	V20'L'K166*V20'G'K59		00002040
	4	BVARIABLE	P25'L'K1359		00002050
	7	BVARIABLE	V20'L'250		00002060
10	11	BVARIABLE	V20'LE'X199*V20'GE'MX1(1,2)*V233'GE'X200		00002070
	14	BVARIABLE	P17'E'K8		00002080
	17	BVARIABLE	V144'L'X194*P8'E'1*P26'E'1	OVERTIME TEST	00002090
	18	BVARIABLE	P19'E'2+P19'E'5		00002100
11	19	BVARIABLE	V20'G'MX3(3,4)*V20'L'X1601*LR14*CH60'E'0	NORA	00002110
	20	BVARIABLE	V20'G'MX1(1,2)*V239'GE'720		00002120
	1	MATRIX	H,10,22		00002130
	2	MATRIX	H,2,2		00002140
	3	MATRIX	H,45,9		00002150
	5	MATRIX	H,45,9		00002160
	6	MATRIX	H,28,28		00002170
	11	MATRIX	H,10,12		00002180
	12	MATRIX	H,10,12		00002190
	13	MATRIX	H,10,12		00002200
12	14	MATRIX	H,10,12		00002210
	15	MATRIX	H,10,12		00002220
	16	MATRIX	H,10,12		00002230
	17	MATRIX	H,10,12		00002240
	1	MATRIX	X,15,13		00002250
	2	MATRIX	X,15,27		00002260
	3	MATRIX	X,12,11		00002270
	4	MATRIX	X,2,40		00002280
	5	MATRIX	X,45,9		00002290
	1	TABLE	P17,0,1,27	NUMBER INSPECTIONS PERFORMED	00002300
	2	TABLE	P8,0,1,11	FLIGHTS BY MISSION TYPE	00002310
	3	TABLE	P17,0,1,27	NUMBER INSPECTIONS	00002320
	4	TABLE	P19,0,1,27	MA'S BY WHEN DISCOVERED	00002330
	5	TABLE	P3,0,1,45	MA'S BY SYSTEM	00002340
	6	TABLE	P19,0,1,27	MA'S BY SYSTEM + WHEN DISCOVERED	00002350
	7	TABLE	FN46,0,1,300		00002360
13	8	TABLE	V56,20,20,125	ORGANIZATIONAL MTTR	00002370
	9	TABLE	V60,100,100,250	DOWNTIME DISTRIBUTION	00002380
	10	TABLE	FN46,0,1,300	NORS EVENTS	00002390
	11	TABLE	FN46,0,1,300	CANNIBALIZED PARTS	00002400
	12	TABLE	FN46,0,1,300	PARTS CAUSING NORS OR CANNIBAIZATION	00002410
	13	TABLE	FN46,0,1,300	PARTS R AND R BY SERVICE PLATOON	00002420
	14	TABLE	V56,0,20,125	MTTR FOR OFF AIRCRAFT PART REPAIR	00002430
14	15	TABLE	FN46,0,1,300		00002440
	18	TABLE	V20,83,1,60	TIME OF START OF DAILY	00002441
15	19	TABLE	P24,0,1,50	DEFERRED MA'S	00002450
		STORAGE	S33,20		00002460
		STORAGE	S34,70		00002461
		STORAGE	S35,270		00002462
16		STORAGE	S36,30		00002463
		STORAGE	S37,20		00002464
		STORAGE	S38,10		00002465
		STORAGE	S39,10		00002466
		STORAGE	S40,20		00002467
		STORAGE	S41,20		00002469

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         STORAGE     S42,20                                        00002470
         STORAGE     S43-S54,899                                   00002471
    *                                                              00002480
    *                                                              00002490
    *                                                              00002500
   1     FUNCTION    P4,D2       RECONFIGURATION SORT              00002510
C    1        1         1                                          00002520
    *                                                              00002530
    *                                                              00002540
   2     FUNCTION    P17,D6      GROUP EVENT PROB OF SUCCESS       00002550
1    9999992    4570975    9999998    46171311    99999916    81378100002560
17   00002021    96000U                                           00002570
    *                                                              00002580
    *                                                              00002590
   3     FUNCTION    P8,D2       PROB NO MA DURING FLIGHT          00002600
0    8941221    737472                                            00002610
    *                                                              00002620
    *                                                              00002630
   4     FUNCTION    P8,D2       MISSION DURATION                 00002640
0    7         1         15                                       00002650
    *                                                              00002660
    *                                                              00002670
   5     FUNCTION    P8,D2       PROB OF NO ABORT/MA IN FLIGHT    00002680
0    8891061    869166                                            00002690
    *                                                              00002700
    *                                                              00002710
   6     FUNCTION    P17,D2      LINE MAINTENANCE MANPOWER,MDS,+DURATION  00002720
2    20030916   200327                                            00002730
    *                                                              00002740
    *                                                              00002750
   7     FUNCTION    P17,D10     MAINTENANCE PRIORITY             00002760
1    1        2         5    3    28   8    29   11   10   12   5  00002770
16   15       17        30   22   20   23   25                    00002780
    *                                                              00002790
    *                                                              00002800
   8     FUNCTION    P17,D2      QUEUE LIMIT GROUND EVENTS        00002810
1    0        3         999999                                    00002820
    *                                                              00002830
    *                                                              00002840
   9     FUNCTION    P19,E9          WHEN DISCOVERED SORT MULTI-FAILURES 00002850
2    FN11   5    FN13   6    FN10   7    FN10   8    FN56   12   FN11  00002860
16   FN12   17   FN14   21   FN51                                 00002870
    *                                                              00002880
    *                                                              00002890
  10     FUNCTION    RN1,D4      PROB MULT MA/MA DURING FLIGHT    00002900
0.86571     0.98762     0.99413     0.99994                       00002910
    *                                                              00002920
    *                                                              00002930
  11     FUNCTION    RN1,D3      PROB MULT MA/MA DURING PREFLIGHT 00002940
0.97851     0.99972     0.99993                                  00002950
    *                                                              00002960
    *                                                              00002970
  12     FUNCTION    RN1,D4      PROB MULT MA/MA DURING DAILY     00002980
0.90051     0.99332     0.99973     0.99994                       00002990
    *                                                              00003000
    *                                                              00003010
  13     FUNCTION    RN1,D2      PROB MULT MA/MA DURING AIRCREW   00003020
0.99101     0.99992                                              00003030
    *                                                              00003040
    *                                                              00003050
  14     FUNCTION    RN1,D25     PROB MULT MA/MA PMP              00003060
0.00021     0.00142     0.00563     0.01694     0.04145     0.08576   00003070
0.15437     0.24718     0.35859     0.480010    0.599211    0.706812  00003080
0.796513    0.865914    0.916015    0.950016    0.971617    0.984618  00003090
0.992019    0.996120    0.998121    0.999122    0.999623    0.999824  00003100
0.999975                                                         00003110
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 *                                                              00003120
 *                                                              00003130
 15      FUNCTION    P19,E8      WHEN DISCOVERED SORT SYSTEM FAILURE  00003140
2     FN19    5     FN16   6      FN17   7      FN18   8      FN57   12    FN19  00003150
16     FN20    17    FN21                                       00003160
 *                                                              00003170
 *                                                              00003180
 16     FUNCTION    RN1,D21     PROB SYSTEM MA AIRCREW/MA AIRCREW     00003190
0.180201      0.189202      0.207203      0.252304      0.342305      0.531506  00003200
0.617107      0.716208      0.725209      0.842310      0.878411      0.891912  00003210
0.905413      0.914414      0.936915      0.955019      0.959520      0.968522  00003220
0.973023      0.977524      0.999925                                00003230
 *                                                              00003240
 *                                                              00003250
 17     FUNCTION    RN1,D20     PROB SYSTEM MA IN-FLIGHT/MA IN-FLIGHT   00003260
0.008701      0.030702      0.042703      0.076104      0.089505      0.171606  00003270
0.251007      0.275008      0.333009      0.357710      0.415711      0.443712  00003280
0.465713      0.483714      0.641915      0.780816      0.874317      0.915718  00003290
0.973119      0.999920                                            00003300
 *                                                              00003310
 *                                                              00003320
 18     FUNCTION    RN1,D15     PROB SYSTEM MA ABURT IN-FLT/MA ABT IN-FLT 00003330
0.021001      0.027602      0.105304      0.147505      0.286106      0.406607  00003340
0.557211      0.587312      0.629513      0.665614      0.743915      0.810216  00003350
0.816217      0.954819      0.999920                                00003360
 *                                                              00003370
 *                                                              00003380
 19     FUNCTION    RN1,D20     PROB SYSTEM MA PREFLIGHT/MA PREFLIGHT   00003390
0.082401      0.139202      0.193603      0.357404      0.372705      0.500606  00003400
0.543207      0.572308      0.682309      0.686610      0.774711      0.793912  00003410
0.808113      0.851814      0.912915      0.946316      0.958417      0.960218  00003420
0.981219      0.999920                                            00003430
 *                                                              00003440
 *                                                              00003450
 20     FUNCTION    RN1,D20     PROB SYSTEM MA DAILY/MA DAILY         00003460
0.045301      0.102702      0.119503      0.225604      0.279005      0.418906  00003470
0.550807      0.557408      0.638209      0.645710      0.730811      0.733412  00003480
0.745113      0.778014      0.811915      0.822316      0.836817      0.841918  00003490
0.973219      0.999920                                            00003500
 *                                                              00003510
 *                                                              00003520
 21     FUNCTION    RN1,D20     PROB SYSTEM MA PMP/MA PMP             00003530
0.120101      0.235002      0.254903      0.435604      0.471305      0.577906  00003540
0.648107      0.652108      0.685309      0.698610      0.736411      0.760212  00003550
0.770813      0.782314      0.856715      0.884916      0.897517      0.899818  00003560
0.985119      0.999920                                            00003570
 *                                                              00003580
 *                                                              00003590
 22     FUNCTION    P3,L20      NUMBER OF ELEMENTS IN SYSTEMS        00003600
01     20     02     24     03     13     04     32     05     8     06     23   00003610
07     22     08     5     09     16     10     11     11     13     12     5    00003620
13     8     14     11     15     26     16     15     17     14     18     7    00003630
19     15     20     6                                            00003640
 *                                                              00003650
 *                                                              00003660
 23     FUNCTION    P19,E8      WHEN DISCOVERED SORT ELEMENT FAILURE  00003670
2     FN27    5     FN24   6      FN25   7      FN26   8      FN58   12    FN27  00003680
16     FN28    17    FN29                                        00003690
 *                                                              00003700
 *                                                              00003710
 24     FUNCTION    FN46,L241   PROB ELEMENT MA AIRCREW/MA SYS AIRCREW 00003720
0101    025    0102    000    0103    050    0104    025    0105    050    0106    150  00003730
0107    125    0108    050    0109    050    0110    075    0111    100    0112    000  00003740
0113    075    0114    100    0115    075    0116    050    0201    000    0202    999  00003750
0203    000    0204    000    0205    000    0301    250    0302    250    0303    250  00003760
0304    250    0305    000    0401    000    0402    200    0401    000    0404    000    00003770
```

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1506    0000001507    0000001508    0000001509    0000001510    0000001511    00000000009060
1512    0000001513    0000001514    0000001515    0000001516    0000001517    00000000009070
1518    0000001519    0000001520    0000001521    0000001522    0000001523    000000000009080
1524    0000001525    0000001526    0280001601    0000001602    0000001603    00000000009090
1604    0000001605    0000001606    0000001607    0000001608    0000001609    00000000009100
1610    0000001611    0000001612    5000001613    0000001614    0000001615    09302300009110
1701    0000001702    0000001703    0000001704    0000001705    0000001706    00000000009120
1707    0000001708    0000001709    0000001710    0000001711    0000001712    00000000009130
1713    0000001714    0000001801    0000001802    0000001803    0000001804    00000000009140
1805    0000001806    0000001807    0000001901    0763361902    2666671903    00000000009150
1904    0000001905    0000001906    0000001907    1666671908    0000001909    00000000009160
1910    1666661911    1666661912    0000001913    2358491914    3030301915    14973300009170
2001    0000002002    0000002003    0000002004    9999992005    0000002006    00000000009180
2007    0000002008    171674                                                  00009190
*                                                                             00009200
*                                                                             00009210
 36     FUNCTION      RN5,C25          LOG NORMAL DISTRIBUTION                 00009220
0       0      .025   332    .050   388    .100   466    .150   527   .200   580   00009230
.250    631    .300   680    .400   779    .500   883    .600   1003  .700   1148  00009240
.750    1237   .800   1345   .850   1482   .900   1675   .920   1782  .940   1921  00009250
.960    2119   .970   2261   .980   2465   .990   2845   .995   3200  .999   4183  00009260
.9998   5185                                                                  00009270
*                                                                             00009280
 37     FUNCTION      FN46,L296        PERCENT REM & REPL,PERCENT GS RPR/RCD   00009290
0101    9990000102    9990000103    9990000104    5000000105    0000000106    00000000009300
0107    0000000108    9990000109    9990000110    9990000111    0000000112    00000000009310
0113    9990000114    9990000115    0000000116    0000000117    5000000118    00000000009320
0119    9990000120    5800000201    9990000202    9990000203    0000000204    99900000009330
0205    9990000206    9990000207    9990000208    9990000209    9990000210    99900000009340
0211    9990000212    8240000213    9990000214    8820000215    8180000216    76900000009350
0217    9720000218    9990000219    9990000220    9990000221    9990000222    99900000009360
0223    9990000224    8040000301    9990000302    9990000303    9990000304    66700000009370
0305    9990000306    9990000307    9990000308    9990000309    9990000310    99900000009380
0311    9990000312    9990000313    8410000401    2860000402    0000000403    00000000009390
0404    2380000405    0910000406    9990000407    3000000408    0000000409    92300000009400
0410    9090000411    8340000412    8570000413    9990000414    0000000415    99900000009410
0416    9990000417    9990000418    9990000419    8330000420    8330000421    83300000009420
0422    8330000423    8330000424    8330000425    9990000426    9990000427    99900000009430
0428    8110000429    8110000430    8110000431    8110000432    6130000501    99900000009440
0502    8750000503    9990000504    9990000505    9990000506    9990000507    94700000009450
0508    8240000601    9990000602    9290000603    9990000604    3640000605    25000000009460
0606    9990000607    5000000608    7500000609    5000000610    9990000611    99900000009470
0612    2640000613    9990000614    6830000615    9990000616    9990000617    99900000009480
0618    7500000619    9990000620    9990000621    6880000622    5000000623    65200000009490
0701    9990000702    9990000703    3330000704    6670000705    9990000706    87900000009500
0707    0000000708    9990000710    8890000711    9990000711    8000000712    68200000009510
0713    9990000714    9990000715    5000000716    9990000717    9990000718    99900000009520
0719    5000000720    5000000721    9990000722    6020000801    9990000802    99900000009530
0803    9330000804    9230000805    9380000901    2860000902    8890000903    99900000009540
0904    9990000905    9990000906    9990000907    9990000908    9990000909    99900000009550
0910    9990000911    9990000912    9990000913    9990000914    9990000915    99900000009560
0916    8110001001    0000001002    9990001003    6670001004    0000001005    62500000009570
1006    0000001007    8180001008    9990001009    9990001010    0000001011    78600000009580
1101    6540001102    0000001103    8820001104    8330001105    9990001106    75000000009590
1107    9990001108    9990001109    9990001110    9990001111    6670001112    85700000009600
1113    8810001201    7780001202    9990001203    9990001204    5000001205    90700000009610
1301    9990001302    9990001303    9990001304    6000001305    9990001306    83300000009620
1307    8890001308    7780001401    9990001402    9990001403    9990001404    83300000009630
1405    9990001406    9990001407    9990001408    9990001409    9990001410    99900000009640
1411    5530001501    9630001502    7140001503    8330001504    6670001505    66700000009650
1506    9990001507    9990001508    5000001509    9990001510    7500001511    80000000009660
1512    9990001513    6000001514    9990001515    9990001516    9990001517    60000000009670
1518    7500001519    5490001520    9380001521    9990001522    7140001523    66700000009680
1524    5710001525    5710001526    7150001601    7780001602    9740001603    99900000009690
1604    7860001605    6000001606    0000001607    5000001608    6000001609    99900000009700
1610    8570001611    9990001612    9990001613    6670001614    9990001615    74500000009710
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1701  6670001702  9990001703  9990001704  9090001705  9990001706  0000000009720
1707  6670001708  9990001709  9420001710  9990001711  1670001712  0670000009730
1713  9990001714  6470001801  9570001802  9990001803  8400001804  9990000009740
1805  7500001806  9990001807  7500001901  9990001902  9990001903  5000000009750
1904  9990001905  9990001906  8750001907  6360001908  8570001909  8570000009760
1910  5710001911  5710001912  0000001913  0500001914  9990001915  5670000009770
2001  7860002002  9990002003  8330002004  5000002005  6670002006  5000000009780
2007  5000002008  873000                                            00009790
38    FUNCTION   FN46,L296   PROB OF PART AVAILABILITY               00009800
0101 999  0102 999  0103 999  0104 999  0105 999  0106 999           00009810
0107 999  0108 999  0109 999  0110 999  0111 999  0112 999           00009820
0113 999  0114 999  0115 999  0116 999  0117 999  0118 999           00009830
0119 999  0120 909  0201 999  0202 999  0203 999  0204 999           00009840
0205 999  0206 999  0207 999  0208 999  0209 999  0210 999           00009850
0211 999  0212 857  0213 999  0214 733  0215 999  0216 999           00009860
0217 000  0218 999  0219 400  0220 999  0221 999  0222 999           00009870
0223 999  0224 932  0301 999  0302 999  0303 000  0304 999           00009880
0305 999  0306 000  0307 999  0308 999  0309 999  0310 999           00009890
0311 999  0312 999  0313 854  0401 000  0402 999  0403 999           00009900
0404 000  0405 999  0406 999  0407 272  0408 999  0409 600           00009910
0410 867  0411 143  0412 999  0413 999  0414 999  0415 000           00009920
0416 999  0417 833  0418 667  0419 500  0420 500  0421 500           00009930
0422 500  0423 500  0424 500  0425 999  0426 999  0427 500           00009940
0428 600  0429 600  0430 600  0431 600  0432 800  0501 667           00009950
0502 429  0503 724  0504 999  0505 999  0506 999  0507 999           00009960
0508 857  0601 999  0602 900  0603 999  0604 999  0605 999           00009970
0606 999  0607 999  0608 999  0609 999  0610 999  0611 000           00009980
0612 963  0613 999  0614 804  0615 999  0616 999  0617 800           00009990
0618 694  0619 999  0620 999  0621 875  0622 833  0623 843           00010000
0701 999  0702 875  0703 999  0704 999  0705 999  0706 999           00010010
0707 999  0708 889  0709 919  0710 976  0711 999  0712 630           00010020
0713 700  0714 999  0715 999  0716 000  0717 999  0718 999           00010030
0719 999  0720 999  0721 999  0722 538  0801 999  0802 714           00010040
0803 999  0804 583  0805 923  0901 999  0902 999  0903 999           00010050
0904 999  0905 500  0906 750  0907 667  0908 750  0909 999           00010060
0910 999  0911 980  0912 999  0913 999  0914 999  0915 999           00010070
0916 873  1001 999  1002 999  1003 999  1004 999  1005 556           00010080
1006 999  1007 998  1008 999  1009 999  1010 999  1011 400           00010090
1101 000  1102 999  1103 999  1104 000  1105 999  1106 167           00010100
1107 800  1108 875  1109 999  1110 999  1111 999  1112 636           00010110
1113 787  1201 999  1202 864  1203 999  1204 999  1205 806           00010120
1301 857  1302 999  1303 999  1304 999  1305 857  1306 400           00010130
1307 750  1308 722  1401 000  1402 999  1403 999  1404 600           00010140
1405 999  1406 999  1407 500  1408 000  1409 000  1410 999           00010150
1411 250  1501 962  1502 999  1503 999  1504 999  1505 500           00010160
1506 999  1507 000  1508 000  1509 999  1510 999  1511 999           00010170
1512 000  1513 999  1514 999  1515 999  1516 999  1517 999           00010180
1518 333  1519 500  1520 933  1521 999  1522 999  1523 999           00010190
1524 000  1525 000  1526 808  1601 867  1602 639  1603 999           00010200
1604 909  1605 719  1606 999  1607 999  1608 999  1609 200           00010210
1610 667  1611 999  1612 500  1613 999  1614 999  1615 855           00010220
1701 999  1702 999  1703 999  1704 950  1705 999  1706 999           00010230
1707 999  1708 999  1709 959  1710 999  1711 999  1712 999           00010240
1713 999  1714 900  1801 999  1802 500  1803 999  1804 999           00010250
1805 999  1806 999  1807 333  1901 999  1902 774  1903 750           00010260
1904 143  1905 400  1906 900  1907 333  1908 000  1909 000           00010270
1910 650  1911 650  1912 999  1913 999  1914 250  1915 843           00010280
2001 818  2002 900  2003 999  2004 667  2005 999  2006 999           00010290
2007 667  2008 933                                                   00010300
39    FUNCTION   P1,E3       VARIABLE SORT FOR WORK CENTER           00010310
1     V50   2    V49    3    V48                                     00010320
*                                                                   00010330
*                                                                   00010340
40    FUNCTION   FN46,L296   SKILL CODE-WORK CENTER ON A/C REPAIR    00010350
0101 0000000102 0000000103 0000000104 0000030105 0003070106 0003070010360
0107 0003070108 0000000109 0000000110 0000000111 0000070112 0001030010370
```

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0113	13	0114	14	0115	15	0116	16	0117	17	0118	18	00013020
0119	19	0120	20	0201	21	0202	22	0203	23	0204	24	00013030
0205	25	0206	26	0207	27	0208	28	0209	29	0210	30	00013040
0211	31	0212	32	0213	33	0214	34	0215	35	0216	36	00013050
0217	37	0218	38	0219	39	0220	40	0221	41	0222	42	00013060
0223	43	0224	44	0301	45	0302	46	0303	47	0304	48	00013070
0305	49	0306	50	0307	51	0308	52	0309	53	0310	54	00013080
0311	55	0312	56	0313	57	0401	58	0402	59	0403	60	00013090
0404	61	0405	62	0406	63	0407	64	0408	65	0409	66	00013100
0410	67	0411	68	0412	69	0413	70	0414	71	0415	72	00013110
0416	73	0417	74	0418	75	0419	76	0420	77	0421	78	00013120
0422	79	0423	80	0424	81	0425	82	0426	83	0427	84	00013130
0428	85	0429	86	0430	87	0431	88	0432	89	0501	90	00013140
0502	91	0503	92	0504	93	0505	94	0506	95	0507	96	00013150
0508	97	0601	98	0602	99	0603	100	0604	101	0605	102	00013160
0606	103	0607	104	0608	105	0609	106	0610	107	0611	108	00013170
0612	109	0613	110	0614	111	0615	112	0616	113	0617	114	00013180
0618	115	0619	116	0620	117	0621	118	0622	119	0623	120	00013190
0701	121	0702	122	0703	123	0704	124	0705	125	0706	126	00013200
0707	127	0708	128	0709	129	0710	130	0711	131	0712	132	00013210
0713	133	0714	134	0715	135	0716	136	0717	137	0718	138	00013220
0719	139	0720	140	0721	141	0722	142	0801	143	0802	144	00013230
0803	145	0804	146	0805	147	0901	148	0902	149	0903	150	00013240
0904	151	0905	152	0906	153	0907	154	0908	155	0909	156	00013250
0910	157	0911	158	0912	159	0913	160	0914	161	0915	162	00013260
0916	163	1001	164	1002	165	1003	166	1004	167	1005	168	00013270
1006	169	1007	170	1008	171	1009	172	1010	173	1011	174	00013280
1101	175	1102	176	1103	177	1104	178	1105	179	1106	180	00013290
1107	181	1108	182	1109	183	1110	184	1111	185	1112	186	00013300
1113	187	1201	188	1202	189	1203	190	1204	191	1205	192	00013310
1301	193	1302	194	1303	195	1304	196	1305	197	1306	198	00013320
1307	199	1308	200	1401	201	1402	202	1403	203	1404	204	00013330
1405	205	1406	206	1407	207	1408	208	1409	209	1410	210	00013340
1411	211	1501	212	1502	213	1503	214	1504	215	1505	216	00013350
1506	217	1507	218	1508	219	1509	220	1510	221	1511	222	00013360
1512	223	1513	224	1514	225	1515	226	1516	227	1517	228	00013370
1518	229	1519	230	1520	231	1521	232	1522	233	1523	234	00013380
1524	235	1525	236	1526	237	1601	238	1602	239	1603	240	00013390
1604	241	1605	242	1606	243	1607	244	1608	245	1609	246	00013400
1610	247	1611	248	1612	249	1613	250	1614	251	1615	252	00013410
1701	253	1702	254	1703	255	1704	256	1705	257	1706	258	00013420
1707	259	1708	260	1709	261	1710	262	1711	263	1712	264	00013430
1713	265	1714	266	1801	267	1802	268	1803	269	1804	270	00013440
1805	271	1806	272	1807	273	1901	274	1902	275	1903	276	00013450
1904	277	1905	278	1906	279	1907	280	1908	281	1909	282	00013460
1910	283	1911	284	1912	285	1913	286	1914	287	1915	288	00013470
2001	289	2002	290	2003	291	2004	292	2005	293	2006	294	00013480
2007	295	2008	296									00013490
*												00013500
*												00013510

```
  47    FUNCTION    P22,D2    PERCENT NRTS (1-8), PERCENT NRTS (1-9)    00013520
 101   0    2008   0                                                   00013530
  *                                                                    00013540
  *                                                                    00013550
```



```
  48    FUNCTION    FN46,L296   PROB OF NO CANNIBALIZATION GIVEN NORS   00013560
```

0101	999	0102	999	0103	999	0104	999	0105	999	0106	999	00013570
0107	999	0108	999	0109	999	0110	999	0111	999	0112	999	00013580
0113	999	0114	999	0115	999	0116	999	0117	999	0118	999	00013590
0119	999	0120	667	0201	999	0202	999	0203	999	0204	999	00013600
0205	999	0206	999	0207	999	0208	999	0209	999	0210	999	00013610
0211	999	0212	000	0213	999	0214	250	0215	999	0216	999	00013620
0217	571	0218	999	0219	999	0220	999	0221	999	0222	999	00013630
0223	999	0224	667	0301	999	0302	999	0303	000	0304	999	00013640
0305	999	0306	667	0307	999	0308	999	0309	999	0310	999	00013650
0311	999	0312	999	0313	667	0401	999	0402	999	0403	999	00013660
0404	333	0405	999	0406	999	0407	429	0408	999	0409	000	00013670

```
1113  0004091201  0008031202  0000001203  0000001204  0000101205  00010900015000
1301  0000001302  0000001303  0000001304  0000101305  0000001306  00001000015010
1307  0000101308  0008031401  0000001402  0000001403  0000001404  00002000015020
1405  0000001406  0000001407  0000001408  0000001409  0000001410  00000000015030
1411  0002101501  0000301502  0000101503  0000101504  0000101505  00001000015040
1506  0000001507  0000001508  0000101509  0000001510  0000161511  00001000015050
1512  0000001513  0005151514  0000001515  0000001516  0000001517  00001000015060
1518  0000101519  0003131520  0005051521  0000001522  0000101523  00001000015070
1524  0004081525  0000101526  0008031601  0000101602  0000101603  00000000015080
1604  0000111605  0000181606  0000101607  0000101608  0000101609  00000000015090
1610  0000101611  0000001612  0000001613  0000101614  0000001615  00001200015100
1701  0007031702  0000001703  0000001704  0000101705  0000001706  00001000015110
1707  0000101708  0000001709  0000101710  0000001711  0006041712  00001000015120
1713  0000001714  0000101801  0000101802  0000001803  0000101804  00000000015130
1805  0000101806  0000001807  0000101901  0000001902  0000001903  00001000015140
1904  0000001905  0000001906  0003071907  0004191908  0015051909  00150500015150
1910  0010031911  0010031912  0003191913  0002091914  0000001915  00050800015160
2001  0000102002  0000002003  0000102004  0003142005  0000202006  00020800015170
2007  0000172008  000509                                          00015180
```

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 55    FUNCTION    P1,E3                                           00015190
1    V136    2    V137    3    V52                                 00015200
*                                                                  00015210
 56    FUNCTION    RN1,D6       PROB MULT MA/MA PMI                00015220
0.67891      0.92692      0.98713      0.99824      0.99985      0.99996     00015230
                                                                   00015240
*                                                                  00015250
 57    FUNCTION    RN1,D19      PROB SYSTEM MA PMI/MA PMI          00015260
0.064501     0.164002     0.281203     0.441304     0.543806     0.594507    00015270
0.597008     0.651709     0.652710     0.671911     0.725112     0.727113    00015280
0.740414     0.792115     0.805916     0.815317     0.817818     0.974919    00015290
0.999920                                                           00015300
*                                                                  00015310
*                                                                  00015320
```

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```
 58    FUNCTION    FN46,L296    PROB ELEMENT MA  P M I  /SYS MA  P M I  00015330
0101 000  0102 000  0103 000  0104 000  0105 000  0106 000   00015340
0107 076  0108 000  0109 091  0110 091  0111 000  0112 038   00015350
0113 015  0114 015  0115 015  0116 000  0117 000  0118 000   00015360
0119 036  0120 618  0201 000  0202 000  0203 050  0204 040   00015370
0205 099  0206 000  0207 000  0208 050  0209 000  0210 000   00015380
0211 079  0212 000  0213 000  0214 000  0215 000  0216 000   00015390
0217 000  0218 000  0219 074  0220 074  0221 149  0222 099   00015400
0223 050  0224 238  0301 042  0302 000  0303 000  0304 000   00015410
0305 021  0306 000  0307 021  0308 000  0309 042  0310 042   00015420
0311 084  0312 033  0313 714  0401 138  0402 000  0403 000   00015430
0404 000  0405 000  0406 000  0407 000  0408 043  0409 031   00015440
0410 142  0411 000  0412 000  0413 000  0414 000  0415 092   00015450
0416 000  0417 000  0418 000  0419 021  0420 021  0421 021   00015460
0422 021  0423 021  0424 021  0425 000  0426 000  0427 000   00015470
0428 017  0429 017  0430 017  0431 017  0432 363  0501 000   00015480
0502 000  0503 000  0504 000  0505 000  0506 000  0507 000   00015490
0508 000  0601 106  0602 000  0603 000  0604 096  0605 000   00015500
0606 000  0607 000  0608 000  0609 000  0610 000  0611 000   00015510
061? 063  0613 000  0614 000  0615 000  0616 010  0617 000   00015520
0618 000  0619 000  0620 063  0621 106  0622 063  0623 495   00015530
0701 000  0702 000  0703 000  0704 097  0705 000  0706 330   00015540
0707 019  0708 000  0709 000  0710 000  0711 000  0712 437   00015550
0713 000  0714 078  0715 000  0716 000  0717 019  0718 000   00015560
0719 000  0720 019  0721 000  0722 000  0801 999  0802 000   00015570
0803 000  0804 000  0805 000  0901 000  0902 000  0903 000   00015580
0904 018  0905 000  0906 000  0907 000  0908 000  0909 000   00015590
0910 144  0911 523  0912 000  0913 000  0914 000  0915 027   00015600
0916 288  1001 000  1002 000  1003 000  1004 000  1005 000   00015610
1006 000  1007 999  1008 000  1009 000  1010 000  1011 000   00015620
1101 000  1102 000  1103 000  1104 000  1105 000  1106 000   00015630
1107 000  1108 256  1109 000  1110 000  1111 000  1112 000   00015640
1113 744  1201 555  1202 185  1203 213  1204 046  1205 000   00015650
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1301 000 1302 000 1303 000 1304 000 1305 500 1306 000 00015660
1307 500 1308 000 1401 185 1402 000 1403 000 1404 000 00015670
1405 185 1406 444 1407 000 1408 000 1409 185 1410 000 00015680
1411 000 1501 000 1502 000 1503 019 1504 095 1505 000 00015690
1506 000 1507 000 1508 000 1509 000 1510 095 1511 000 00015700
1512 000 1513 000 1514 000 1515 048 1516 095 1517 000 00015710
1518 019 1519 000 1520 000 1521 019 1522 048 1523 000 00015720
1524 000 1525 000 1526 562 1601 000 1602 536 1603 000 00015730
1604 179 1605 000 1606 071 1607 000 1608 000 1609 071 00015740
1610 071 1611 000 1612 000 1613 071 1614 000 1615 000 00015750
1701 000 1702 000 1703 000 1704 000 1705 000 1706 000 00015760
1707 000 1708 000 1709 000 1710 105 1711 105 1712 000 00015770
1713 000 1714 789 1801 000 1802 000 1803 000 1804 999 00015780
1805 000 1806 000 1807 000 1901 107 1902 197 1903 000 00015790
1904 323 1905 000 1906 000 1907 031 1908 000 1909 000 00015800
1910 024 1911 024 1912 000 1913 000 1914 000 1915 295 00015810
2001 588 2002 137 2003 000 2004 000 2005 000 2006 039 00015820
2007 235 2008 000                                       00015830
 70    FUNCTION    FN46,L296   SKILL CODE-WORK CENTER-  REMOVE & REPLACE 00015840
0101 0000030102 0002030103 0007030104 0007030105 0000000106 00000000015850
0107 0000000108 0000070109 0007030110 0007030111 0000000112 00000000015860
0113 0000030114 0000030115 0000000116 0000000117 0007050118 00000000015870
0119 0000030120 0007030201 0000030202 0003020203 0000000204 00000300015880
0205 0003020206 0000030207 0002030208 0002030209 0000030210 00010300015890
0211 0005030212 0002030213 0000050214 0005030215 0002050216 00020300015900
0217 0000030218 0000030219 0002030220 0000030221 0000030222 00000300015910
0223 0010030224 0002030301 0000030302 0000040303 0000030304 00000300015920
0305 0000030306 0000030307 0000030308 0000030309 0000030310 00030200015930
0311 0002030312 0000030313 0010030401 0001030402 0000000403 00000000015940
0404 0001030405 0000030406 0000030407 0001030408 0000000409 00000300015950
0410 0006030411 0006030412 0000030413 0001030414 0000030415 00000300015960
0416 0000030417 0000030418 0000030419 0002030420 0002030421 00020300015970
0422 0002030423 0002030424 0002030425 0007030426 0005030427 00020300015980
0428 0007030429 0007030430 0007030431 0007030432 0002030501 00020300015990
0502 0000030503 0002030504 0000030505 0000020506 0002030507 00020300016000
0508 0005030601 0006030602 0006030603 0002030604 0009030605 00000300016010
0606 0000030607 0000030608 0001030609 0000030610 0000030611 00000300016020
0612 0000030613 0000030614 0009030615 0000030616 0000030617 00000300016030
0618 0008030619 0002080620 0002030621 0007030622 0006030623 00060300016040
0701 0009030702 0009030703 0000030704 0009030705 0002030706 00020300016050
0707 0000000708 0003090709 0009030710 0003090711 0009030712 00030900016060
0713 0005030714 0005030715 0000020716 0000030717 0000040718 00000300016070
0719 0000030720 0000030721 0000030722 0003090801 0008020802 00080300016080
0803 0002030804 0009030805 0007030901 0002080902 0000080903 00000800016090
0904 0000030905 0003080906 0008030907 0000080908 0003080909 00030800016100
0910 0002030911 0003080912 0003080913 0003080914 0000020915 00000800016110
0916 0008031001 0000001002 0001031003 0000031004 0000001005 00010300016120
1006 0000001007 0003041008 0000031009 0000031010 0000001011 00010300016130
1101 0005031102 0000001103 0005031104 0002031105 0005031106 00080300016140
1107 0005081108 0002081109 0000031110 0000031111 0000031112 00000300016150
1113 0005031201 0002031202 0000031203 0003081204 0001031205 00020300016160
1301 0002031302 0000031303 0000031304 0000031305 0000081306 00080400016170
1307 0008041308 0007081401 0000031402 0003081403 0001031404 00080300016180
1405 0000031406 0000031407 0000031408 0000031409 0008031410 00000300016190
1411 0002031501 0008031502 0000081503 0009031504 0002031505 00000400016200
1506 0000041507 0000041508 0000081509 0000081510 0003081511 00080400016210
1512 0001041513 0004031514 0000081515 0000081516 0000071517 00030800016220
1518 0008031519 0009081520 0008031521 0003021522 0001031523 00080300016230
1524 0003081525 0004081526 0003081601 0000041602 0001041603 00020400016240
1604 0000041605 0000041606 0000001607 0000041608 0000041609 00000400016250
1610 0003081611 0000041612 0000041613 0000041614 0000041615 00010400016260
1701 0008031702 0000041703 0001041704 0000041705 0000041706 00000000016270
1707 0003041708 0000041709 0008041710 0008041711 0000011712 00000400016280
1713 0000041714 0008041801 0000041802 0000041803 0008041804 00000400016290
1805 0003041806 0000041807 0000041901 0000031902 0009031903 00090300016300
1904 0003091905 0003081906 0008031907 0001091908 0003091904 00030900016310
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     1910   0003091911   0003091912   0000001913   0009031914   0009031915   00030900016320
     2001   0009032002   0009032003   0008032004   0000032005   0000032006   00090200016330
     /007   0007092008   000309                                               00016340
25   71     FUNCTION     P1,E3        VARIABLE SORT FOR WORK CENTERS, RGR      00016350
1           V270  2      V269  3      V268                                     00016360
            INITIAL      XH78,1586                                             00016370
            INITIAL      MH11(1-4,5),1       MON   ROW=LAUNCH,DATA=PRIORITY    00016380
            INITIAL      MH13(1-5,5),1             ROW=LAUNCH,DATA=PRIORITY    00016400
            INITIAL      MH14(1-4,5),1       THU   ROW=LAUNCH,DATA=PRIORITY    00016410
            INITIAL      MH15(1-4,5),1       FRI   ROW=LAUNCH,DATA=PRIORITY    00016420
            INITIAL      MH11(1,10),1        MON   NO. OF A/C LAUNCH1          00016430
            INITIAL      MH13(1,10),1        WED   NO. OF A/C LAUNCH1          00016450
            INITIAL      MH14(1,10),1        THU   NO. OF A/C LAUNCH1          00016460
            INITIAL      MH15(1,10),1        FRI   NO. OF A/C LAUNCH1          00016470
            INITIAL      MH11(2,10),1        MON   NO. OF A/C LAUNCH2          00016480
            INITIAL      MH13(2,10),1        WED   NO. OF A/C LAUNCH2          00016500
            INITIAL      MH14(2,10),1        THU   NO. OF A/C LAUNCH2          00016510
            INITIAL      MH15(2,10),1        FRI   NO. OF A/C LAUNCH2          00016520
26          INITIAL      MH11(3,10),2        MON   NO. OF A/C LAUNCH3          00016530
            INITIAL      MH13(3,10),1        WED   NO. OF A/C LAUNCH3          00016550
            INITIAL      MH14(3,10),2        THU   NO. OF A/C LUANCH3          00016560
            INITIAL      MH15(3,10),1        FRI   NU. OF A/C LAUNCH3          00016570
            INITIAL      MH11(4,10),1        MON   NO. OF A/C LAUNCH4          00016580
            INITIAL      MH13(4,10),2        WED   NO. OF A/C LAUNCH4          00016600
            INITIAL      MH14(4,10),1        THU   NO. OF A/C LAUNCH4          00016610
            INITIAL      MH15(4,10),1        FRI   NO. OF A/C LAUNCH4          00016620
            INITIAL      MH13(5,10),1        WED   NO. OF A/C LAUNCH5          00016625
            INITIAL      MH11(1,11),88       MON   TIME FROM 00:12 TO 1ST LAUNCH 00016630
            INITIAL      MH13(1,11),88       WED   TIME FROM 00:12 TO 1ST LAUNCH 00016650
            INITIAL      MH14(1,11),88       THU   TIME FROM 00:12 TO 1ST LAUNCH 00016660
            INITIAL      MH15(1,11),88       FRI   TIME FROM 00:12 TO 1ST LAUNCH 00016670
            INITIAL      MH11(2,11),5        MON   TIME BETWEEN LAUNCH 1&2     00016680
            INITIAL      MH13(2,11),1        WED   TIME BETWEEN LAUNCH 1&2     00016700
            INITIAL      MH14(2,11),5        THU   TIME BETWEEN LAUNCH 1&2     00016710
            INITIAL      MH15(2,11),5        FRI   TIME BETWEEN LAUNCH 1&2     00016720
            INITIAL      MH11(3,11),20       MON   TIME BETWEEN LAUNCH 2&3     00016730
            INITIAL      MH13(3,11),4        WED   TIME BETWEEN LAUNCH 2&3     00016750
            INITIAL      MH14(3,11),20       THU   TIME BETWEEN LAUNCH 2&3     00016760
            INITIAL      MH15(3,11),20       FRI   TIME BETWEEN LAUNCH 2&3     00016770
            INITIAL      MH11(4,11),20       MON   TIME BETWEEN LAUNCH 3&4     00016780
            INITIAL      MH13(4,11),20       WED   TIME BETWEEN LAUNCH 3&4     00016800
            INITIAL      MH14(4,11),20       THU   TIME BETWEEN LAUNCH 3&4     00016810
            INITIAL      MH15(4,11),20       FRI   TIME BETWEEN LAUNCH 3&4     00016820
            INITIAL      MH13(5,11),20       WED   TIME BETWEEN LAUNCH 4&5     00016825
            INITIAL      MH11(2,12),107      MON   TIME BETWEEN LAUNCH 4&00:12 00016830
            INITIAL      MH13(2,12),107      WED   TIME BETWEEN LAUNCH 4&00:12 00016850
            INITIAL      MH14(2,12),107      THU   TIME BETWEEN LAUNCH 3&00:12 00016860
            INITIAL      MH15(2,12),107      FRI   TIME BETWEEN LAUNCH 4&00:12 00016870
            INITIAL      MH11(1,12),4        MON   NO. OF LAUNCHES PER DAY     00016880
            INITIAL      MH13(1,12),5        WED   NO. OF LAUNCHES             00016900
            INITIAL      MH14(1,12),4        THU   NO. OF LAUNCHES PER DAY     00016910
            INITIAL      MH15(1,12),4        FRI   NO. OF LAUNCHES PER DAY     00016920
            INITIAL      MH1(1,13),480       NON FLYING HOURS WEEKEND         00016930
            INITIAL      MH1(1,14),1200      FLYING HOURS WEEKDAYS            00016940
            INITIAL      MH1(3,12),5         SLACK TIME                       00016950
            INITIAL      MH1(8,12),14        TIME FROM CALL TO LAUNCH         00016960
            INITIAL      MH1(6,13),0         TIME TO PERFORM AIRCREW INSPECTION 00016970
            INITIAL      MH1(7,13),5         LAUNCH TIME TO REPLACE ABORTS    00016980
            INITIAL      MH1(1,17),999       PERCENT IN-FLT ABORTS REPLACED   00016990
            INITIAL      MH1(1,15),1         NO STANDBY A/C BY MISSION TYPE   00017000
            INITIAL      MH1(1,18),18        FLT DURATION FOR ABORT REPLACEMENTS 00017010
            INITIAL      MH1(1,16),2         NO.PRELAUNCH EVENTS              00017020
            INITIAL      MH1(1,21),5         TIME LAUNCH WINDOW STAYS OPEN    00017030
            INITIAL      MH1(1,15),1         STANDBY AIRCRAFT MISSION 1       00017040
            INITIAL      MH1(2,16),2             PRELAUNCH EVENTS             00017050
            INITIAL      MH1(6,17),1200      5 DAY FLYING PERIOD              00017060
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        INITIAL    MH1(6,18),480      2 DAY NONFLYING PERIOD              00017070
        INITIAL    MX3(1,1),80        FIRST SHIFT DURATION = 8 HRS        00017080
        INITIAL    MX3(2,1),0         SECOND SHIFT DURATION = 0 HRS       00017090
        INITIAL    MX3(1,4),83        START OFFSET SHIFT 1 PERIOD 1       00017100
        INITIAL    MX3(3,2),80        WORKING INTERVAL DAILY ********     00017110
        INITIAL    MX3(3,3),160       NON WORKING INTERVAL DAILY ****     00017120
        INITIAL    MX3(3,4),85        START WORK OFFSET **************     00017130
        INITIAL    MX3(2,2),1200      WORKING INTERVAL CONTROL WEEKLY***  00017140
        INITIAL    MX3(2,3),480       NONWORKING INTERVAL WEEKLY *******  00017150
        INITIAL    MX1(2,1),20        PMP MANPOWER PRIMARY W.C.(1)        00017160
        INITIAL    MX1(2,3),10        PMP MANPOWER SECONDARY W.C.(3)      00017170
        INITIAL    MX1(3,1),160       PMP HOURS PRIMARY W.C.(1)           00017180
        INITIAL    MX1(3,3),100       PMP HOURS SECONDARY W.C.(3)         00017190
        INITIAL    MX1(1,8),160       PMP LOOK PHASE EMT                  00017200
        INITIAL    MX1(10,1),10       PMI MANPOWER PRIMARY W.C.(1)        00017210
        INITIAL    MX1(10,3),10       PMI MANPOWER SECONDARY W.C.(3)      00017220
        INITIAL    MX1(11,1),60       PMI HOURS PRIMARY W.C.(1)           00017230
        INITIAL    MX1(11,3),60       PMI HOURS SECONDARY W.C.(3)         00017240
        INITIAL    MX1(1,9),60        PMI LOOK PHASE EMT                  00017250
        INITIAL    MX1(1,2),83        FIRST DAILY AT 8:30 ***********     00017260
        INITIAL    MX1(1,3),240       TIME BETWEEN DAILIES                00017270
        INITIAL    MX1(4,7),1         NORS/CANNIB. ELEMENT MODE           00017280
        INITIAL    MX1(1,8),720       MINIMUM ELAPSED DOWNTIME PMP = 72 HRS00017290
        INITIAL    MX1(1,9),280       MINIMUM ELAPSED DOWNTIME PMI = 28 HRS00017300
        INITIAL    MX1(1,10),3        DAYS BETWEEN DAILIES NON FLYING     00017310
        INITIAL    MX1(4,10),15       DEFERRED MA'S   MAXIMUM NO. ALLOWED 00017320
        INITIAL    MX1(5,9),1         SIMULATE FACTOR                     00017430
********** TBO TIMES                                                     00017431
        INITIAL    MH6(26,1-2),800/MH6(26,3-8),2500/MH6(26,9-12),1600    00017440
        INITIAL    MH6(26,13),625/MH6(26,14-16),1200/MH6(26,17),2400     00017450
        INITIAL    MH6(26,18-21),800                                     00017460
********** TBO ELEMENTS                                                  00017461
        INITIAL    MH6(27,1),401/MH6(27,2),414/MH6(27,3),419             00017470
        INITIAL    MH6(27,4),420/MH6(27,5),421/MH6(27,6),422             00017480
        INITIAL    MH6(27,7),423/MH6(27,8),424/MH6(27,9),428             00017490
        INITIAL    MH6(27,10),429/MH6(27,11),430/MH6(27,12),431          00017500
        INITIAL    MH6(27,13),604/MH6(27,14),609/MH6(27,15),610          00017510
        INITIAL    MH6(27,16),1005/MH6(27,17),1405/MH6(27,18),1908       00017520
        INITIAL    MH6(27,19),1909/MH6(27,20),1910/MH6(27,21),1911       00017530
********** TBO DISPOSITION  4=CONDEMNED,6=OVERHAULED                     00017531
        INITIAL    MH6(28,1-21),4                                        00017540
        INITIAL    MH1(1,22),000      % MISSION AC WITH ORDNANCE         00017550
        INITIAL    MH1(6,14),30000    FLYING HOUR GOAL                   00017560
        INITIAL    X195,99999                                            00017570
        INITIAL    X196,00                                               00017580
        INITIAL    X197,21            NO. TBO ITEMS                      00017590
        INITIAL    X191,9             NO. AIRCRAFT PER COMPANY           00017600
        INITIAL    X189,1000          PMP INTERVAL                       00017610
        INITIAL    X193,480           NO.OF "WEEKEND" NON-WORKING HOURS  00017620
        INITIAL    X194,0             OVERTIME CRITERIA (NO. AIRCRAFT)   00017630
        INITIAL    X190,250           PMI INTERVAL                       00017640
        INITIAL    X192,5             NO. OF WORKING DAYS/WEEK           00017650
        INITIAL    X1526,720                                             00017660
        INITIAL    X1527,-720                                            00017670
        INITIAL    MX1(5,1),120960    EIGHTEEN MONTHS                    00017680
        INITIAL    MX1(4,6),99999     MAXIMUM FLYING HOURS               00017690
        INITIAL    X199,135           TIME OF LAST DAILY, 13:30          00017700
        INITIAL    X200,190           HRS CANNOT PERFORM DAILY           00017710
        INITIAL    X1601,165          TIME OF END OF 1ST SHIFT           00017720
        INITIAL    MX1(4,8),5         TIME TO GET PART                   00017721
        INITIAL    X1602,0     % INCREASE SUPPLY DELAY (0=DUMMY)         00017722
                                                                        00017730
* MISSION GENERATOR ROUTINE                                             00017740
*                                                                       00017750
*   SCHEDULED MISSION SUBROUTINE                                        00017760
*                                                                       00017770
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*                                                                      00017780
ZZA     GENERATE   ,,2,1,50,25,F                                       00017790
        SPLIT      1,DLCA,,25                                          00017800
        SPLIT      1,EDSIM,,65                                  1.27   00017801
        SPLIT      1,MPCA,,25                                          00017810
        SPLIT      1,FTA,,25                                           00017820
        SPLIT      1,DCRA,,25                                          00017830
        SPLIT      1,DATA,,25                                          00017840
        SPLIT      1,HLDY1,,25                                  NORA   00017841
        ASSIGN     13,11                                               00017850
SMGF    ASSIGN     9+,K1                                               00017860
SMGG    ADVANCE    MH*P13(*9,11)      DAILY LAUNCH SCHEDULE CHANGE     00017870
        TEST E     P9,K1,SMGT                                          00017880
        SPLIT      1,SACA,,25                                          00017890
SMGT    ASSIGN     2,5                                                 00017900
SMGB    TEST GE    MH*P13(*9,V1),K1,SMGE   DAILY LAUNCH SCHEDULE CHANGE 00017910
        ASSIGN     3,MH*P13(*9,V1)    DAILY LAUNCH SCHEDULE CHANGE     00017920
        ASSIGN     4,MH*P13(*9,*2)    DAILY LAUNCH SCHEDULE CHANGE     00017930
        LOOP       2,SMGC                                              00017940
SMGD    SPLIT      1,SMGH,,25                                          00017950
SMGE    GATE LR    2,SMGQ                                              00017960
        TEST E     P9,MH*P13(1,12),SMGF   DAILY LAUNCH SCHEDULE CHANGE 00017970
        ADVANCE    MH*P13(2,12)       DAILY LAUNCH SCHEDULE CHANGE     00017980
        ASSIGN     9,K1                                                00017990
SIK6    GATE LR    1                  DAILY LAUNCH SCHEDULE CHANGE     00018000
        ASSIGN     13,V267            FOR DAY OF WEEK LAUNCH MATRIX    00018010
        TEST NE    MH*P13(1,12),0,SIK5  IS THERE FLYING TODAY?         00018011
        TRANSFER   ,SMGG                                               00018020
SMGC    SPLIT      1,SMGH,,25                                          00018030
        TRANSFER   ,SMGB                                               00018040
SMGH    GATE LR    V8,SMGQ                                             00018050
        GATE LR    1,SMGQ                                              00018060
        GATE LR    2,SMGQ                                              00018070
        ASSIGN     2+,K1                                               00018080
        ASSIGN     6,C1                                                00018090
        SPLIT      1,SMGR,,25                                          00018100
        SAVEVALUE  P4+,P3,H                                            00018110
SMGN    ALTER      16,ALL,7,P6,15,1                                    00018120
        ALTER      16,ALL,8,*4,15,1                                    00018130
SMGK    UNLINK     1,PLAB,1,11,P4,SMGJ                                 00018140
        LOOP       3,SMGK                                              00018150
SMGQ    TERMINATE                                                      00018160
SMGJ    ASSIGN     1+,K1                                               00018170
        TEST E     P1,K6,SMGL                                          00018180
        TEST E     P11,K0,SMGM                                         00018190
        MARK       7                                                   00018200
        ASSIGN     11,1                                                00018210
        ASSIGN     8,MH1(3,12)                                         00018220
SMGM    ADVANCE    1                                                   00018230
        TEST G     MP7,P8,SMGP                                         00018240
        UNLINK     4,ARM37,1,,,ARM39                                   00018250
        SPLIT      1,ARM40,,60                                         00018260
        ASSIGN     3-,K1                                               00018270
ARM39   SAVEVALUE  V5+,P3,H                                            00018280
        TRANSFER   ,SMGQ                                               00018290
SMGL    ASSIGN     4,FN1                                               00018300
        TRANSFER   ,SMGK                                               00018310
SMGP    ASSIGN     1,K0                                                00018320
        ASSIGN     4,MH*P13(*9,*2)    DAILY LAUNCH SCHEDULE CHANGE     00018330
        TRANSFER   ,SMGN                                               00018340
SMGR    ADVANCE    MH1(8,12)                                           00018350
        BUFFER                                                         00018360
        LOGICS     V6                                                  00018370
        LOGICS     19                                                  00018380
        ADVANCE    MH1(P4,21)                                          00018390
        BUFFER                                                         00018400
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              LOGICR        V6                                                        00018410
              LOGICR        19                                                        00018420
              TRANSFER      ,SMGQ                                                      00018430
29(3) SIK5    ADVANCE       240        DELAY ONE DAY IF NO LAUNCHES TODAY             00018440
              TRANSFER      ,SIK6      RETURN TO LAUNCH GENERATOR NEXT DAY            00018441
      HLDY1   ADVANCE       238                                              NORA      00018442
      HLDY6   TEST G        RN8,52,HLDY2                                     NORA      00018443
      HLDY5   ADVANCE       240                                             NORA      00018444
              TRANSFER      ,HLDY6                                          NORA      00018445
      HLDY2   UNLINK        1,NORA1,ALL                                     NORA      00018446
              TEST NE       V266,5,HLDY8                                    NORA      00018447
              TEST NE       V266,6,HLDY9                                    NORA      00018448
              ASSIGN        1,240                                           NORA      00018449
      HLDYA   ADVANCE       P1                                              NORA      00018450
      HLDY7   UNLINK        60,NORA2,ALL                                    NORA      00018451
              TRANSFER      ,HLDY6                                          NORA      00018452
      HLDY8   ASSIGN        1,720                                           NORA      00018453
              TRANSFER      ,HLDYA                                          NORA      00018454
      HLDY9   ASSIGN        1,480                                           NORA      00018455
              TRANSFER      ,HLDYA                                          NORA      00018456
      NORA1   MARK                                                          NORA      00018457
              LINK          60,FIFO                                         NORA      00018458
      NORA2   SAVEVALUE     1750+,M1                                        NORA      00018459
              LINK          1,FIFO                                          NORA      00018460
*                                                                                    00018470
*     FLYING TERMINATION SUBROUTINE                                                  00018480
*                                                                                    00018490
      FTA     PRIORITY      80                                                       00018500
              SPLIT         1,FTH,,25                                                 00018510
              SPLIT         4,FTB,2,25                                               00018520
      FTB     ASSIGN        3,MH1(*2,14)                                             00018530
              TEST GE       P3,K1,SMGQ                                               00018540
              ASSIGN        4,MH1(*2,13)                                             00018550
              ADVANCE       V9                                                       00018560
      FTC     LOGICS        1                                                        00018570
              SPLIT         1,FTF,,25                                                00018580
              ADVANCE       P4                                                       00018590
              UNLINK        2,SMGQ,1                                                 00018600
              UNLINK        2,FTD,1,,,FTE                                            00018610
              TRANSFER      ,FTG                                                     00018620
      FTE     LOGICR        1                                                        00018630
      FTG     ADVANCE       P3                                                       00018640
              TRANSFER      ,FTC                                                     00018650
      FTF     LINK          2,FIFO                                                   00018660
      FTD     TRANSFER      ,FTF                                                     00018670
      FTH     ASSIGN        1,MX1(4,6)                                               00018680
              TEST NE       P1,K0,SMGQ                                               00018690
              SPLIT         1,FTR,,25                                                00018700
      FTJ     TEST GE       XH11,P1,FTK                                             00018710
              LOGICS        2                                                        00018720
              LOGICS        1                                                        00018730
              TERMINATE                                                              00018740
      FTK     ADVANCE       20                                                       00018750
              TRANSFER      ,FTJ                                                     00018760
      FTR     SPLIT         1,FTL,,25                                               00018770
              SPLIT         1,FTT,,25                                               00018780
              SPLIT         4,FTX,11,25                                             00018790
      FTX     ASSIGN        5,MH1(V2,18)                                            00018800
              TEST GE       P9,K1,SMGQ                                              00018810
              ASSIGN        1,V3                                                    00018820
              ASSIGN        6,MH1(V2,17)                                            00018830
              LOGICS        V7                                                      00018840
              ADVANCE       MH1(V2,16)                                             00018850
      FTZ     LOGICR        V7                                                      00018860
              ADVANCE       P6                                                     00018870
              LOGICS        V7                                                     00018880
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        ADVANCE      P9                                              00018890
        GATE LR      *1,SMGQ                                         00018900
        TRANSFER     ,FTZ                                            00018910
FTL     SPLIT        4,FTP,11,25                                     00018920
FT?     ASSIGN       5,MH1(V2,14)                                    00018930
        TEST GE      P9,K1,SMGQ                                      00018940
        ASSIGN       1,V3                                            00018950
        ASSIGN       8,V4                                            00018960
FTN     TEST GE      XH*8,P9,FTM                                     00018970
        LOGICS       V7                                              00018980
        LOGICS       *1                           .                  00018990
        TERMINATE                                                    00019000
FTM     ADVANCE      10                                              00019010
        TRANSFER     ,FTN                                            00019020
FTT     SPLIT        4,FTS,11,25                                     00019030
FTS     ASSIGN       9,MH1(V2,15)                                    00019040
        TEST GE      P9,K1,SMGQ                                      00019050
        LOGICS       V7                                              00019060
        ADVANCE      P9                                              00019070
        LOGICR       V7                                              00019080
        TERMINATE                                                    00019090
*                                                                    00019100
*                                                                    00019110
*                                                                    00019120
*                                                                    00019130
* AIRCRAFT ROUTINE                                                   00019140
*                                                                    00019150
*                                                                    00019160
*       AIRCRAFT COMPLEMENT SUBROUTINE                               00019170
*                                                                    00019180
*                                                                    00019190
*                                                                    00019200
*                                                                    00019210
*                                                                    00019220
ZZB     GENERATE     ,,1,X191,90,60,F   GENERAL                     00019230
        ASSIGN       47,V10                                          00019240
        ASSIGN       11,1                                            00019250
AAA     JOIN         25                                              00019260
        ASSIGN       41,V11                                          00019270
        ASSIGN       40,V231         INITIALIZE AIRFRAME HOURS       00019280
*                                                                    00019290
        ASSIGN       46,X1527        FLAG AIRCRAFT FOR DAILY         00019300
        ASSIGN       48,X1527        FLAG AIRCRAFT FOR DAILY         00019310
*                                                                    00019320
*                                                                    00019330
*                                                                    00019340
        ASSIGN       14,N$AAA                                        00019350
        JOIN         13                                     1.27     00019351
        MSAVEVALUE   6,25,P14,P40,H                                  00019360
        SAVEVALUE    17+,K1,H                                        00019370
        ASSIGN       15,X197      ITBO ITEMS TO BE INITIALIZED       00019380
ARM16   MSAVEVALUE   6,P14,P15,V146,H                                00019390
        LOOP         15,ARM16                                        00019400
        JOIN         16                                              00019410
        JOIN         23                                              00019420
AAC     ASSIGN       15,1                                            00019430
        TEST NE      P35,999,HLH2       INSURES AGAINST A SECOND PMI 00019440
        TEST L       V147,V234,ARM17    GENERAL                      00019450
        TEST L       V11,V236,ARM17        TEST FOR CALENDAR PMP     00019460
        TEST L       V148,V235,ARM19    GENERAL                      00019470
HLH2    JOIN         29      THIS LOGIC IS VALID FOR                 00019480
        ASSIGN       35,K0               ALL RUNS TO STOP EXTRA PMI'S 00019490
AAD     TEST NE      6V20,1,DLB                                      00019500
        LINK         1,FIFO                                          00019510
AAB     TEST NE      P26,K2,AAF                                      00019520
        ASSIGN       16,K0                                           00019530
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         AAF     PRIORITY    90                                        00019540
                 TRANSFER    ,AAC                                      00019550
         ARM17   TEST G      V238,FN4,HLH2                             00019560
                 ASSIGN      15,K0                                     00019570
                 JOIN        30                                        00019580
                 ASSIGN      17,17                                     00019590
                 SAVEVALUE   V169+,K1                                  00019600
                 SAVEVALUE   V170+,K1                                  00019610
                 SAVEVALUE   450+,K1                                   00019620
                 SAVEVALUE   1050+,K1                                  00019630
                 TRANSFER    ,ARM18                                    00019640
         ARM19   TEST G      V238,FN4,HLH2                             00019650
                 ASSIGN      15,K0                                     00019660
                 JOIN        37                                        00019670
                 ASSIGN      17,8                                      00019680
                 SAVEVALUE   V165+,K1                                  00019690
                 SAVEVALUE   V166+,K1                                  00019700
                 SAVEVALUE   400+,K1                                   00019710
                 SAVEVALUE   1000+,K1                                  00019720
                 TRANSFER    ,ARM23                                    00019730
         *                                                             00019740
         *                                                             00019750
         *           STANDBY AIRCRAFT SUBROUTINE                       00019760
         *                                                             00019770
         SACA    PRIORITY    70                                        00019780
                 ASSIGN      4,K0                                      00019790
                 SPLIT       4,SACB,4,25                               00019800
         SACB    ASSIGN      3,MH1(*4,15)                              00019810
                 GATE LR     V8,SMGQ                                   00019820
                 TEST GE     P3,K1,SMGQ                                00019830
         SACG    EXECUTE     SMGH                                      00019840
                 ASSIGN      2,P4                                      00019850
         SACE    ALTER       16,ALL,8,*4,15,1                          00019860
                 GATE LR     1,SMGQ                                    00019870
                 TEST E      BV3,K1,SMGQ                               00019880
         SACC    UNLINK      1,PLAA,1,,,SACD                           00019890
                 LOOP        3,SACC                                    00019900
                 TERMINATE                                             00019910
         SACD    ASSIGN      1+,K1                                     00019920
                 TEST GE     P1,K6,SACF                                00019930
                 ASSIGN      4,P2                                      00019940
                 ASSIGN      1,K0                                      00019950
                 ADVANCE     1                                         00019960
                 TRANSFER    ,SACE                                     00019970
         SACF    ASSIGN      4,FN1                                     00019980
                 TRANSFER    ,SACC                                     00019990
         SACH    ASSIGN      4,P8                                      00020000
                 REMOVE      32                                        00020010
                 ASSIGN      1,K0                                      00020020
                 ASSIGN      3,1                                       00020030
                 TRANSFER    ,SACG                                     00020040
         ARM40   ASSIGN      8,K1                                      00020050
                 TRANSFER    ,SACH                                     00020060
         *                                                             00020070
         *                                                             00020080
         *                                                             00020090
         *     AIRCRAFT MAINLINE SUBROUTINE                            00020100
         *                                                             00020110
         *                                                             00020120
         *     PRELAUNCH LOOP                                          00020130
         *                                                             00020140
         PLAA    ASSIGN      16,1                                      00020150
         PLAB    ASSIGN      15,2                                      00020160
                 TEST E      P16,KJ,ARM41                              00020170
                 SAVEVALUE   V151+,K1                                  00020180
                 SAVEVALUE   225+,K1                                   00020190
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          SAVEVALUE    V152+,K1                                    00020200
          SAVEVALUE    825+,K1                                     00020210
ARM41     REMOVE       29                                          00020220
          JOIN         28        .                                 00020230
PLAT      ASSIGN       19,K0                                       00020240
          ASSIGN       17,MH1(*8,16)                               00020250
          TEST NE      P8,P11,PLAG                                 00020260
          ASSIGN       9,K1                                        00020270
PLAG      ASSIGN       1,MH1(*8,22)                                00020280
PLAX      TEST E       P17,K1,PLAC                                 00020290
          TRANSFER     .*1,PLAH,PLAC                               00020300
PLAC      TRANSFER     SBR,LIA,5                                   00020310
          TEST LE      V13,FN2,PLAK                                00020320
PLAH      LOOP         17,PLAX                                     00020330
PLAN      ASSIGN       17,5                                        00020340
          ENTER        1                                          00020350
          ADVANCE      MH1(6,13)                                   00020360
          TABULATE     3                                          00020370
          TEST LE      V13,FN2,PLAL                                00020380
PLAJ      TEST NE      P16,K1,PLAD                                 00020390
PLAF      ENTER        2                                          00020400
          GATE LS      V14                                         00020410
PLAQ      REMOVE       28                                          00020420
          MARK                                                     00020430
          UNLINK       3,TSTHA,ALL,12,P12                          00020440
          LEAVE        2                                          00020450
          GATE LR      V15,PLAM                                    00020460
          TRANSFER     ,FLTA                                       00020470
PLAM      LEAVE        1                                          00020480
          TRANSFER     ,AAB                                        00020490
PLAK      ASSIGN       19,P17                                      00020500
          REMOVE       28                                          00020510
          ASSIGN       18,PLAR                                     00020520
          TRANSFER     ,CMA                                        00020530
PLAL      ASSIGN       19,P17                                      00020540
          REMOVE       28                                          00020550
          ASSIGN       18,PLAS                                     00020560
          TRANSFER     ,CMA                                        00020570
PLAD      JOIN         27                                          00020580
          REMOVE       28                                          00020590
          ASSIGN       15,K37                                      00020600
          LINK         4,FIFO                                      00020610
PLAE      REMOVE       27                                          00020620
          ASSIGN       15,K2                                       00020630
          SPLIT        1,SACH,,60                                  00020640
          JOIN         28                                          00020650
          TRANSFER     ,PLAF                                       00020660
PLAR      JOIN         28                                          00020670
          TRANSFER     ,PLAH                                       00020680
PLAS      JOIN         28                                          00020690
          TRANSFER     ,PLAJ                                       00020700
ARM37     ASSIGN       16,K0                                       00020710
          SAVEVALUE    V151+,K1                                    00020720
          SAVEVALUE    V152+,K1                                    00020730
          SAVEVALUE    225+,K1                                     00020740
          SAVEVALUE    825+,K1                                     00020750
          TRANSFER     ,PLAN                                       00020760
*                                                                  00020770
*                                                                  00020780
*                                                                  00020790
*                                                                  00020800
*                                                                  00020810
*                                                                  00020820
*         FLIGHT LOOP                                              00020830
*                                                                  00020840
FLTA      JOIN         26                                          00020850
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       FLTL  TABULATE    2                                                    00020860
             ENTER       V14                                                  00020870
             TEST LE     P8,K5,FLTE                                           00020880
             TEST LE     V13,FN3,FLTC                                         00020890
             SAVEVALUE   V16+,K1,H                                            00020900
  ┌──┐ FLTD  ADVANCE     FN4                                                  00020910
  │33│       ASSIGN      40,X1527     AIRCRAFT HAS FLOWN, FLAG FOR DAILY      00020920
  └──┘       TEST G      P8,K0,ARM42                                          00020930
             SAVEVALUE   V153+,K1                                             00020940
             SAVEVALUE   250+,K1                                              00020950
             SAVEVALUE   V154+,K1                                             00020960
             SAVEVALUE   850+,K1                                              00020970
             SAVEVALUE   V155+,FN4          TABULATE FLIGHT TIME              00020980
             SAVEVALUE   275+,FN4           THESE LOGIC CHANGES               00020990
             SAVEVALUE   V156+,FN4          ARE GOOD FOR ALL SUCCESSIVE       00021000
             SAVEVALUE   875+,FN4           RUNS                              00021010
             ASSIGN      40+,FN4            CORRECT ERROR IN ACCOUNTING P40   00021020
       FLTH  LEAVE       V14                THIS CHANGE IS GOOD FOR ALL RUNS  00021030
             ASSIGN      16,K0                                               00021040
             TEST LE     P8,K5,FLTK                                          00021050
       FLTG  SAVEVALUE   V17+,M1,H                                           00021060
             SAVEVALUE   11+,M1,H                                            00021070
             SAVEVALUE   7+,M1                                               00021080
             ASSIGN      11,P8                                               00021090
             LEAVE       1                                                   00021100
             PRIORITY    20,BUFFER                                           00021110
             PRIORITY    90                                                  00021120
             REMOVE      26                                                  00021130
             REMOVE      34                                                  00021140
             TEST G      P19,5,AAB                                           00021150
             ASSIGN      18,AAB                                              00021160
             TRANSFER    ,CMA                                                00021170
       ARM42 SAVEVALUE   V205+,K1                                            00021180
             SAVEVALUE   775+,K1                                             00021190
             SAVEVALUE   V207+,FN4          GENERALIZE ACCOUNTING OF          00021200
             SAVEVALUE   800+,FN4     TEST HOP FLIGHT HOURS                   00021210
             SAVEVALUE   V204+,K1                                            00021220
             SAVEVALUE   1375+,K1                                            00021230
             SAVEVALUE   V206+,FN4          THIS CHANGE IS GOOD FOR ALL       00021240
             SAVEVALUE   1400+,FN4    SUBSEQUENT RUNS                         00021250
             ASSIGN      40+,FN4            ACCOUNT FOR TEST HOPS ON P40      00021260
             TRANSFER    ,FLTH                                               00021270
       FLTC  TEST LE     V13,FN5,FLTJ                                        00021280
             ASSIGN      19,6                                                00021290
             TRANSFER    ,FLTD                                               00021300
       FLTJ  ASSIGN      19,7                                                00021310
             TRANSFER    .999,FLTF,FLTE                                      00021320
       FLTF  UNLINK      4,FLTB,1,8,P8                                       00021330
  ┌──┐ FLTE  ADVANCE     V18                                                 00021340
  │34│       ASSIGN      46,X1527     AIRCRAFT HAS FLOWN, FLAG FOR DAILY      00021350
  └──┘  *                             FOLLOWING CHANGE GOOD FOR ALL RUNS      00021360
             TEST G      P8,K0,HLH3         ROUTE ABORTED TEST HOPS           00021370
             TEST L      V147,V234,HLH21  GENERAL-ROUTINE INSURES             00021380
             TEST L      V11,V236,HLH21                                      00021390
             TEST L      V148,V235,HLH21    AGAINST DOING AN                  00021400
             TRANSFER    ,HLH22             EXTRA PMI ON AN                   00021410
       HLH21 ASSIGN      35,999             ABORT,RIGHT AFTER A               00021420
       HLH22 SAVEVALUE   V208+,K1           PMI.GOOD FOR ALL RUNS.            00021430
             SAVEVALUE   V209+,K1                                            00021440
             SAVEVALUE   V210+,V18          GENERALIZE ACCOUNTING OF          00021450
             SAVEVALUE   V211+,V18          ABORTED FLIGHT TIME               00021460
             SAVEVALUE   1450+,K1                                            00021470
             SAVEVALUE   1500+,K1     CHANGES ARE GOOD FOR                    00021480
             SAVEVALUE   1475+,V18    ALL SUBSEQUENT RUNS                     00021490
             SAVEVALUE   1398+,V18          ALL SUBSEQUENT RUNS               00021500
             ASSIGN      40+,V18            ACCOUNT FOR ABORTED HRS ON A/C    00021510
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        TRANSFER    ,FLTH           CHANGES GOOD FOR ALL RUNS       00021520
HLH3    SAVEVALUE   198+,K1     # OF ABORTED   TEST HOPS            00021530
        ASSIGN      40+,V18         GENERALIZE                     00021540
        TEST L      V147,V234,HLH5  ACCOUNTING                     00021550
        TEST L      V11,V236,HLH5                                  00021560
        TEST L      V148,V235,HLH5  ON ABORTED                     00021570
        TRANSFER    ,FLTH           TEST HOPS                      00021580
HLH5    ASSIGN      35,K999                                        00021590
        TRANSFER    ,FLTH                                          00021600
FLTB    SPLIT       1,SACH,,60                                     00021610
        ADVANCE     MH1(7,13)                                      00021620
        ASSIGN      46,V237                                        00021630
        ASSIGN      40+,MH1(7,13)                                  00021640
        MARK                                                       00021650
        ASSIGN      8+,K6                                          00021660
        TRANSFER    ,FLTA                                          00021670
TSTHP   ASSIGN      8,K0                                           00021680
        GATE LR     1,AAB                                          00021690
        JOIN        34                                             00021700
        MARK        6                                              00021710
        ENTER       1                                              00021720
        GATE LS     19                                             00021730
        SPLIT       1,TSTHB,,60                                    00021740
        LINK        3,FIFO                                         00021750
TSTHB   TEST E      BV2,0,TSTHC                                    00021760
        ADVANCE     V19                                            00021770
TSTHC   UNLINK      3,TSTHA,ALL                                    00021780
        TERMINATE                                                  00021790
TSTHA   MARK                                                       00021800
        TRANSFER    ,FLTL                                          00021810
UNLK    TRANSFER    P,21                                           00021820
FLTK    ASSIGN      8-,K6                                          00021830
        TRANSFER    ,FLTG                                          00021840
*                                                                  00021850
*                                                                  00021860
*       POST FLIGHT LOOP                                           00021870
*                                                                  00021880
PFAG    TEST E      P19,K0,PFAF                                    00021890
PFAE    TEST E      BV2,K1,PFAA                                    00021900
        ASSIGN      17,K12                                         00021910
        JOIN        28                                             00021920
        ASSIGN      16,K2                                          00021930
        TRANSFER    SBR,LIA,5                                      00021940
        REMOVE      28                                             00021950
        TEST LE     V13,FN2,PFAD                                   00021960
PFAC    TRANSFER    ,AAB                                           00021970
PFAF    ASSIGN      16,PFAE                                        00021980
        TRANSFER    ,CMA                                           00021990
PFAA    ASSIGN      16,AAB                                         00022000
PFAB    ASSIGN      17,11                                          00022010
        JOIN        35                                             00022020
        TRANSFER    SBR,LIA,5                                      00022030
        REMOVE      35                                             00022040
        TRANSFER    P,18                                           00022050
PFAD    ASSIGN      19,12                                          00022060
        ASSIGN      16,K0                                          00022070
        ASSIGN      15,PFAC                                        00022080
        TRANSFER    ,CMA                                           00022090
*                                                                  00022100
*                                                                  00022110
*                                                                  00022120
*                                                                  00022130
* PREVENTIVE MAINTENANCE ROUTINE                                   00022140
*                                                                  00022150
*                                                                  00022160
*    DAILY INSPECTION SUBROUTINE                                   00022170
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*                                                              00022180
        DLCA    PRIORITY    40                                 00022190
                ASSIGN      2,MX1(1,3)                         00022200
                TEST GE     P2,K1,SMGG                         00022210
                ADVANCE     MX1(1,2)                           00022220
        ARM36   ASSIGN      3,X192                             00022230
*                                      CH-47C                  00022240
        DLCB    GATE LR     1,DLCC                             00022250
        DLCD    UNLINK      1,DLB,ALL                          00022260
                UNLINK      4,DLA,ALL                          00022270
                ASSIGN      14,KO                              00022280
        DLCE    ADVANCE     P2                                 00022290
                LOOP        3,DLCB                             00022300
                ADVANCE     X193                               00022310
*           ON THIS CARD FOR OTHER THAN A 7 DAY WEEK USE ADVANCE 480  00022320
                TRANSFER    ,ARM36                             00022330
                TRANSFER    ,DLCB                              00022340
        DLCC    ASSIGN      14+,K1                             00022350
                TEST E      V21,KO,DLCE                        00022360
                TRANSFER    ,DLCD                              00022370
        DLA     ASSIGN      16,KO                              00022380
                REMOVE      27                                 00022390
                LEAVE       1                                  00022400
                ASSIGN      19,KO                              00022410
        DLB     TEST GE     V239,X1526,DLB2   TEST FOR DAILY   00022420
                TEST G      BV11,KO,DLB2      TEST TO SEE IF DAILY CAN BE DONE  00022430
                MARK        46                                 00022440
                MARK        48          MARK TIME OF LAST DAILY  00022450
                ASSIGN      17,16                              00022460
                REMOVE      29                                 00022470
                ASSIGN      16,KO                              00022480
                ASSIGN      15,2                               00022490
                TRANSFER    ,DLH                               00022500
        DLB2    LINK        1,FIFO                             00022510
        DLH     ASSIGN      17,K16                             00022520
                TABULATE    18     TIME DAILY PERFORMED        00022525
                TABULATE    19     NUMBER OF DEFERRED MA'S     00022530
        DLE     TEST LE     P24,MX1(4,10),RLARA               00022540
                JOIN        33                                 00022550
                TRANSFER    SBR,LIA,5                          00022560
        DLD     ADVANCE     KO                                 00022570
                REMOVE      33                                 00022580
                TEST GE     V148,V235,DLC   LOGIC CHANGE TO FLAG AIRCRAFT  00022590
                ASSIGN      35,999      THAT HAVE JUST HAD A PMI  00022600
        DLC     TEST G      V13,FN2,AAB                        00022610
                ASSIGN      19,P17                             00022620
                ASSIGN      18,AAB                             00022630
                TRANSFER    ,CMA                               00022640
*                                                              00022650
*                                                              00022660
*   LINE MAINTENANCE SUBROUTINE                                00022670
*                                                              00022680
        LIA     QUEUE       P17                                00022690
                ASSIGN      22,V23                             00022700
                ASSIGN      2,V24                              00022710
                TEST NE     P22,KO,LMM                         00022720
                MARK                                           00022730
                ENTER       V26                                00022740
                QUEUE       V27                                00022750
        LMI     GATE LR     20,LMB                             00022760
        LMF     ASSIGN      3,V28                              00022770
                ASSIGN      4,KO                               00022780
        LMD     TEST GE     R*3,P22,LMG                        00022790
                DEPART      V27                                00022800
                DEPART      P17                                00022810
                ENTER       *3,P22                             00022820
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            ASSIGN      20,V25                                  00022830
            ADVANCE     P20                                     00022840
            TEST NE     P17,K2,ARM30                            00022850
            TEST NE     P17,K16,ARM31                           00022860
ARM32 LEAVE             *3,P22                                  00022870
            LEAVE       V26                                     00022880
            TABULATE    3                                       00022890
            MSAVEVALUE  2+,P2,P17,V29                           00022900
            SAVEVALUE   V30+,V29                                00022910
            SAVEVALUE   20+,V29                                 00022920
            UNLINK      V31,UNLK,ALL                            00022930
            TRANSFER    P,5,1                                   00022940
ARM30 SAVEVALUE         V157+,K1                                00022950
            SAVEVALUE   300+,K1                                 00022960
            SAVEVALUE   V158+,K1                                00022970
            SAVEVALUE   900+,K1                                 00022980
            SAVEVALUE   V159+,V191                              00022990
            SAVEVALUE   325+,V191                               00023000
            SAVEVALUE   V160+,V191                              00023010
            SAVEVALUE   925+,V191                               00023020
            TRANSFER    ,ARM32                                  00023030
ARM31 SAVEVALUE         V161+,K1                                00023040
            SAVEVALUE   350+,K1                                 00023050
            SAVEVALUE   V162+,K1                                00023060
            SAVEVALUE   950+,K1                                 00023070
            SAVEVALUE   V163+,V191                              00023080
            SAVEVALUE   375+,V191                               00023090
            SAVEVALUE   V164+,V191                              00023100
            SAVEVALUE   975+,V191                               00023110
            TRANSFER    ,ARM32                                  00023120
LMB   ASSIGN            3,V27                                   00023130
            ASSIGN      4,1                                     00023140
            TRANSFER    ,LMD                                    00023150
LMG   ASSIGN            21,LME                                  00023160
            ASSIGN      23,FN7                                  00023170
            LINK        V31,P23                                 00023180
LME   TEST E            P16,K0,LMI                              00023190
            TEST NE     P8,K0,LMI                               00023200
            TEST NE     P17,K1,LMP                              00023210
            TEST G      M1,FN8,LMI                              00023220
LMN   DEPART           V27                                      00023230
            DEPART      P17                                     00023240
LML   LEAVE            V26                                      00023250
            REMOVE      28                                      00023260
            TRANSFER    ,AAB                                    00023270
LMM   DEPART           P17                                      00023280
            TRANSFER    P,5,1                                   00023290
LMP   TEST G           MP7,FN8,LMI                              00023300
            TRANSFER    ,LMN                                    00023310
      *                                                         00023320
      *     PMP-PMI SUBROUTINE                                  00023330
      *                                                         00023340
      *                                                         00023350
  [38] ARM18 TEST NE    MH6(1,1),0,PMLY    ON CONDITION         00023360
            ASSIGN      12,X197                                 00023370
      ARM22 TEST G      V149,X189,ARM24  GENERAL                00023380
            ASSIGN      47,0           ZERO TIME SINCE LAST CALENDAR  00023390
      ARM21 LOOP        12,ARM22                                00023400
      PMLY  ADVANCE                                             00023410
      ARM23 PRIORITY    20,BUFFER                               00023420
  [39]     ASSIGN       49,P40         ACFH AT PMI/PMP          00023430
            MARK                                                00023440
            ASSIGN      35,999                                  00023450
            ASSIGN      26,K0                                   00023460
            ASSIGN      15,2                                    00023470
            ASSIGN      21,PMCH                                 00023480
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        ASSIGN      23,FN7                                              00023490
        ASSIGN      2,K0                                                00023500
        SPLIT       1,PMCF,,60                                          00023510
        QUEUE       P17                                                 00023520
        ENTER       V26                                                 00023530
        DEPART      P17                                                 00023540
        SPLIT       1,PMCG,,60                                          00023550
        SPLIT       1,PMCR,,60                                          00023560
PMCM    ASSEMBLE    13                                                  00023570
        PRIORITY    90                                                  00023580
        LEAVE       V26                                                 00023590
        TABULATE    3                                                   00023600
        REMOVE      30                                                  00023610
        REMOVE      37                                                  00023620
        TEST NE     P17,K17,PMCZ                                        00023630
        TEST E      P17,K8,ARM33                                        00023640
ARM33   SPLIT       1,REEG                                              00023650
        TEST LE     V13,FN2,HLH1        PUT IN LOGIC TO                 00023660
        ASSIGN      27,K0               DETECT FAILURES AT              00023670
        TEST E      P24,K0,RLARA        PMI AND DO AWAY WITH TEST HOPS  00023680
        TRANSFER    ,AAB                AFTER PMI.GOOD FOR ALL RUNS     00023690
PMCAA   TEST LE     V13,FN2,PMCS                                        00023700
        TEST E      P24,K0,PMCT                                         00023710
        TRANSFER    ,ARRG                                               00023720
HLH1    ASSIGN      19,P17              CHANGES TO ALLOW FOR            00023730
        ASSIGN      25,K1               UNSCHEDULED MAINTENANCE         00023740
        ASSIGN      27,K0               AT PMI,AND TO DO AWAY WITH TEST 00023750
        TRANSFER    ,CMA                HOPS.GOOD FOR ALL RUNS          00023760
PMCZ    SPLIT       1,REAA,,60                                          00023770
        TRANSFER    ,PMCAA                                              00023780
PMCS    ASSIGN      19,P17                                              00023790
        ASSIGN      25,K1                                               00023800
        ASSIGN      27,K1                                               00023810
        TRANSFER    ,CMA                                                00023820
PMCT    ASSIGN      27,K1                                               00023830
        TRANSFER    ,RLARA                                              00023840
PMCF    LINK        27,FIFO                                             00023850
PMCG    ADVANCE     MX1(1,V32)                                          00023860
        UNLINK      27,SMGQ,1,14,P14                                    00023870
        TRANSFER    ,PMCM                                               00023880
PMCR    SPLIT       10,PMCU,2,60                                        00023890
FMCU    ASSIGN      3,MX1(V33,*2)                                       00023900
        TEST GE     P3,K1,PMCM                                          00023910
        ASSIGN      4,MX1(V34,*2)                                       00023920
        TEST E      P17,K8,ARM34                                        00023930
        SAVEVALUE   V167+,V36                                           00023940
        SAVEVALUE   V168+,V36                                           00023950
        SAVEVALUE   425+,V36                                            00023960
        SAVEVALUE   1025+,V36                                           00023970
PMCV    QUEUE       V27                                                 00023980
PMCH    GATE LR     20,PMCJ                                             00023990
        ASSIGN      7,V28                                               00024000
        ASSIGN      20,V35                                              00024010
        ASSIGN      55,PMCV             10.23.74                        00024020
        TEST G      P20,0,PMCN1         10.23.74                        00024030
        ASSIGN      8,1                                                 00024040
PMCK    TEST GE     R*7,P3,PMCL                                         00024050
PMCO    TEST LE     P4,P20,PMCN                                         00024060
PMCQ    DEPART      V27                                                 00024070
        ENTER       *7,P3                                               00024080
        ADVANCE     P4                                                  00024090
        LEAVE       *7,P3                                               00024100
        UNLINK      P7,UNLK,ALL                                         00024110
        MSAVEVALUE  2+,P2,P17,V36                                       00024120
        SAVEVALUE   V37+,V36                                            00024130
        SAVEVALUE   32+,V36                                             00024140
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            TEST E      P26,K0,PMCP                             00024150
            TRANSFER    ,PMCM                                   00024160
    ARM34   TEST L      P17,K17,PMCV                            00024170
            SAVEVALUE   V171+,V36                               00024180
            SAVEVALUE   V172+,V36                               00024190
            SAVEVALUE   475+,V36                                00024200
            SAVEVALUE   1075+,V36                               00024210
            TRANSFER    ,PMCV                                   00024220
    PMCJ    ASSIGN      7,V27                                   00024230
            ASSIGN      8,K0                                    00024240
            ASSIGN      20,V38                                  00024250
            TRANSFER    ,PMCK                                   00024260
    PMCN    ASSIGN      22,V39                                  00024270
            ASSIGN      4,P20                                   00024280
            ASSIGN      26,K1                                   00024290
            TEST E      P4,K0,PMCQ                              00024300
            DEPART      V27                                     00024310
    PMCP    ASSIGN      4,P22                                   00024320
            PRIORITY    1,BUFFER                                00024330
            PRIORITY    20                                      00024340
            ASSIGN      26,K0                                   00024350
            TRANSFER    ,PMCV                                   00024360
    PMCL    LINK        P7,P23                                  00024370
    ARM24   SPLIT       1,ARM20                                 00024380
            TRANSFER    ,ARM21                                  00024390
    PMCN1   ADVANCE                         10.23.74            00024400
            TEST E      P55,PMCV,QTEST      10.23.74            00024410
    DEPQ    DEPART      V27                 10.23.74            00024420
            PRIORITY    90                  10.23.74            00024430
            ADVANCE     MX3(3,3)            10.23.74            00024440
            PRIORITY    20                  10.23.74            00024450
    RETUR   TRANSFER    P,55                10.23.74            00024460
    FIRST   PRIORITY    1,BUFFER            10.23.74            00024470
            PRIORITY    20                  10.23.74            00024480
            TRANSFER    ,RETUR              10.23.74            00024490
    QTEST   TEST E      P55,UNSK,QTT1       10.23.74            00024500
            DEPART      25                  10.23.74            00024510
            TRANSFER    ,DEPQ               10.23.74            00024520
    QTT1    DEPART      44                  10.23.74            00024530
            TRANSFER    ,DEPQ               10.23.74            00024540
    *                                                           00024550
    *       TIME CHANGE OVERHAUL ,RETIREMENT SUBROUTINE         00024560
    *                                                           00024570
    *                                                           00024580
    ARM20   ASSIGN      22,MH6(27,P12)                          00024590
            MSAVEVALUE  6,*14,*12,V150,H                        00024600
            ASSIGN      12,1                                    00024610
            ASSIGN      6,9                                     00024620
            ASSIGN      25,K1359                                00024630
            ASSIGN      17,19                                   00024640
            MSAVEVALUE  5+,V46,*6,K1,H                          00024650
            SAVEVALUE   V175+,K1                                00024660
            SAVEVALUE   525+,K1                                 00024670
            SAVEVALUE   V176+,K1                                00024680
            SAVEVALUE   1125+,K1                                00024690
            TRANSFER    ,MPAA                                   00024700
    *                                                           00024710
    *                                                           00024720
    *                                                           00024730
    *                                                           00024740
    * FAILURE DETERMINATION ROUTINE                             00024750
    *                                                           00024760
    CMA     ASSIGN      2,FN9                                   00024770
            TABULATE    4                                       00024780
            TEST LE     P2,K10,FDA  NEEDED TO ENSURE PROPER SAVEVALUES  00024790
    *                   WHEN GREATER THAN 10 MA'S ARE FOUND     00024800
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*                                                       00024810
*                                                       00024820
        SAVEVALUE   V40+,K1,H                           00024830
FDA     ASSIGN      24+,K1                              00024840
        ASSIGN      3,FN15                              00024850
        TABULATE    5                                   00024860
        TABULATE    6                                   00024870
        SAVEVALUE   V173+,K1                            00024880
        SAVEVALUE   500+,K1                             00024890
        SAVEVALUE   V174+,K1                            00024900
        SAVEVALUE   1100+,K1                            00024910
        SAVEVALUE   V41+,K1,H                           00024920
        ASSIGN      4,K23                               00024930
        SAVEVALUE   1,RN2                               00024940
        ASSIGN      5,FN22                              00024950
        MSAVEVALUE  2,2,1,0,H                           00024960
FDB     ASSIGN      22,V42                              00024970
        TEST NE     P5,K1,ARM54                         00024980
        MSAVEVALUE  2+,2,1,FN*4,H                       00024990
ARM55   TEST LE     X1,MH2(2,1),FDD                     00025000
        TABULATE    7                                   00025010
        SPLIT       1,FDK,,60                           00025020
        TEST E      P19,K7,FDL                          00025030
        ASSIGN      19,6                                00025040
FDC     ASSIGN      25,K1                               00025050
FDF     LOOP        2,FDA                               00025060
        TEST E      P25,K1,FDN                          00025070
        TEST E      BV18,1,RLARA                        00025080
        UNLINK      4,ARM37,1,,,ARM38                   00025090
        SPLIT       1,ARM40,,60                         00025100
ARM38   TEST E      P19,K5,RLARA                        00025110
        SAVEVALUE   33+,K1                              00025120
        TRANSFER    ,RLARA                              00025130
FDD     LOOP        5,FDB                               00025140
FDL     TEST E      P19,K5,FDP                          00025150
        TEST G      RN3,FN30,FDC                        00025160
FDR     GATE LS     1,FDF                               00025170
        TRANSFER    ,FDC                                00025180
FDN     TEST NE     P27,K1,FDM                          00025190
        ASSIGN      25,K0                               00025200
        ASSIGN      19,K0                               00025210
        TRANSFER    P,18                                00025220
FDK     LINK        32,FIFO                             00025230
ARM54   MSAVEVALUE  2,2,1,999,H                         00025240
        TRANSFER    ,ARM55                              00025250
FDM     ASSIGN      27,K0                               00025260
        TEST E      P35,999,ARM56                       00025270
        ASSIGN      35,0                                00025280
        TRANSFER    ,TSTHP                              00025290
FDP     TEST L      RN3,V135,FDF                        00025300
        TRANSFER    ,FDC                                00025310
ARM56   TEST L      V147,V234,ARM17  GENERAL            00025320
        TEST L      V11,V236,ARM17                      00025330
        TEST L      V148,V235,ARM19  GENERAL            00025340
        TRANSFER    ,TSTHP                              00025350
*                                                       00025360
*                                                       00025370
*                                                       00025380
*                                                       00025390
* REPAIR LOCATION AND RESPOT SUBROUTINE                 00025400
*                                                       00025410
RLARA   JOIN        32                                  00025420
        TEST E      P19,K5,RLARB                        00025430
        LEAVE       1                                   00025440
RLARB   TEST E      P16,K1,RLARC                        00025450
        SPLIT       1,SACH,,60                          00025460
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         RLARC TEST E      BV1,K1,RLARD                           00025470
   [42]        ASSIGN     18,RLARK                                00025480
               TRANSFER   ,PFAB                                   00025490
         RLARD MARK                                               00025500
         RLARK TEST E      BV2,K1,RLARE                           00025510
               TEST E      BV7,K0,RLARE                           00025520
               ASSIGN     18,V44                                  00025530
               TEST L      P18,MX1(4,2),RLARL                     00025540
               ASSIGN     18,MX1(4,2)                             00025550
         RLARL ADVANCE    P18                                     00025560
               SAVEVALUE  34+,M1                                  00025570
         RLARE PRIORITY   80,BUFFER                               00025580
               PRIORITY   90                                      00025590
               UNLINK     32,USMA,ALL,14,P14,AAB                  00025600
               ASSIGN     20,K123                                 00025610
               ASSIGN     24+,K1                                  00025620
               REMOVE     32                                      00025630
               SPLIT      1,RLARH,,60                             00025640
               TRANSFER   ,ARRA                                   00025650
         RLARH PRIORITY   110,BUFFER                              00025660
               SPLIT      1,RLARG,,60                             00025670
         RLARF JOIN       32                                      00025680
               ASSEMBLE   P24                                     00025690
               SAVEVALUE  V187+,M1                                00025700
               SAVEVALUE  625+,M1                                 00025710
               SAVEVALUE  V186+,M1                                00025720
               SAVEVALUE  1225+,M1                                00025730
               SAVEVALUE  35+,M1                                  00025740
               SAVEVALUE  V195+,M1                                00025750
               SAVEVALUE  675+,M1                                 00025760
               SAVEVALUE  V194+,M1                                00025770
               SAVEVALUE  1275+,M1                                00025780
               SCAN       40,14,P14,,,RLARM                       00025790
               REMOVE     32                                      00025800
               JOIN       31                                      00025810
         RLARN MATCH      RLARP                                   00025820
               TERMINATE                                          00025830
         RLARG JOIN       40                                      00025840
               ASSEMBLE   P24                                     00025850
               SAVEVALUE  36+,M1                                  00025860
               REMOVE     40                                      00025870
         RLARP MATCH      RLARN                                   00025880
               JOIN       32                                      00025890
         RLARQ MATCH      ARRJ                                    00025900
         RLARM TERMINATE                                          00025910
       *                                                          00025920
       *                                                          00025930
       *                                                          00025940
       *                                                          00025950
       *                                                          00025960
       *         REPAIR PART ASSESSMENT SUBROUTINE                00025970
       *                                                          00025980
         USMA  PRIORITY   60,BUFFER                               00025990
               MARK                                               00026000
               ASSIGN     18,K0                                   00026010
               ASSIGN     25,V45                                  00026020
   [43] RPAB   TEST NE    P25,999,RPAA   IF 999 THEN R+R 12.18.74 00026029
               TRANSFER   .*25,RPAD,RPAA              12.18.74    00026030
         RPAA  ADVANCE    MX1(4,8)                                00026040
               ASSIGN     25,K1359                                00026050
               MSAVEVALUE 5+,V46,2,1,H                            00026060
   [44]        SAVEVALUE  175+,K1                                 00026070
               TEST LE    RN1,FN38,NORCA         11.12.74         00026080
         RPAC  TRANSFER   ,MPAA                                   00026090
         RPAD  MSAVEVALUE 5+,V46,1,1,H                            00026100
               SAVEVALUE  176+,K1                                 00026110
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         *                                                              00026120
         *                                                              00026130
         *    MANPOWER ASSESSMENT SUBROUTINE                            00026140
         *                                                              00026150
         MPAA  ASSIGN      1,K3                                         00026160
         MPAB  TEST E      P25,1359,ARM1    REMOVE AND REPLACE?         00026170
               ASSIGN      V47,FN71    ASSIGN W.C. FOR REMOVE AND REPLACE  00026180
               ASSIGN      V51,FN41    ASSIGN MANPOWER REMOVE AND REPLACE  00026190
               TRANSFER    ,ARM2                                        00026200
         ARM1  ASSIGN      V47,FN39    ASSIGN W.C. ON AIRCRAFT REPAIR   00026210
               ASSIGN      V51,FN55    ASSIGN MANPOWER ON AIRCRAFT REPAIR  00026220
         ARM2  LOOP        1,MPAB                                       00026230
         *                                                              00026240
         *                                                              00026250
         *    MTTR SUBROUTINE                                           00026260
         *                                                              00026270
         ARM3  TEST E      P25,K1359,ARM4                               00026280
         MTRA  ASSIGN      4,V55                                        00026290
               .TRANSFER   ,ARM5                                       00026300
         ARM4  ASSIGN      4,V138                                       00026310
         ARM5  TABULATE    8                                            00026320
               TEST L      P4,K1,GSEA          12.12.74 WAS K2          00026330
               ASSIGN      4,K1                12.12.74 WAS K2          00026340
         *                                                              00026350
         *    GSE SUBROUTINE                                            00026360
         *                                                              00026370
         GSEA  TRANSFER    ,UNSA                                        00026380
         GSEB  ASSIGN      1,V57                                        00026390
               ADVANCE     P1                                           00026400
               SAVEVALUE   37+,P1                                       00026410
         *                                                              00026420
         *                                                              00026430
         *                                                              00026440
         *                                                              00026450
         * UNSCHEDULED MAINTENANCE ROUTINE                              00026460
         *                                                              00026470
         UNSA  TEST NE     P17,K19,ARM25                                00026480
               ASSIGN      17,K23                                       00026490
         ARM25 TEST E      P27,K0,UNSB                                  00026500
         UNSJ  ASSIGN      3,P29                                        00026510
               ASSIGN      2,P26                                        00026520
               ASSIGN      26,K0                                        00026530
         UNSK  QUEUE       V27                                          00026540
               QUEUE       25                                           00026550
         UNSE  GATE LR     20,UNSC                                      00026560
               ASSIGN      7,V28                                        00026570
               ASSIGN      20,V35                                       00026600
               ASSIGN      55,UNSK              10.23.74                00026601
               TEST G      P20,0,PMCN1          10.23.74                00026602
               ASSIGN      8,1                                          00026610
         UNSD  TEST GE     R*7,P3,UNSP                                  00026620
               TEST LE     P4,P20,UNSF                                  00026630
         UNSG  DEPART      V27                                          00026640
               DEPART      25                                           00026650
               ENTER       *7,P3                                        00026660
               ADVANCE     P4                                           00026670
               TEST NE     BV17,K1,ARM14                                00026680
         ARM15 LEAVE       *7,P3                                        00026690
               UNLINK      P7,UNLK,ALL                                  00026700
               MSAVEVALUE  2+,P2,P17,V36                                00026710
               TEST NE     P17,K19,ARM10                                00026720
         ARM61 SAVEVALUE   V58+,V36                                     00026730
               SAVEVALUE   49+,V36                                      00026740
               SAVEVALUE   V189+,V36                                    00026750
               SAVEVALUE   575+,V36                                     00026760
               SAVEVALUE   V190+,V36                                    00026770
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*                                                              00027440
     ARRA  ASSIGN     10,C1                              1.27  00027450
           GATHER     P24                                1.27  00027451
           ASSIGN     10,0                               1.27  00027452
           PRIORITY   90,BUFFER                                00027460
           TEST NE    P20,K123,ARRB                            00027470
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*  ***********DELETED TEST NE  P8,K0,ARRB    THERE IS NO 2ND SHIFT   00027480
           TEST E     FN44,1,ARRB                              00027490
           TRANSFER   .057,ARRB,ARRH        CH-54B DATA  2.3.75 00027500
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     ARRH  LOGICS     21                                       00027510
     ARRB  ASSEMBLE   P24                                      00027520
     ARRJ  MATCH      RLARQ                                    00027530
           ASSIGN     19,K0                                    00027540
           ASSIGN     24,K0                                    00027550
           ASSIGN     20,K0                                    00027560
           ASSIGN     25,K0                                    00027570
           ASSIGN     16,K0                                    00027580
     ARRC  TABULATE   9                                        00027590
           SAVEVALUE  18B+,V60                                 00027600
           TEST E     P27,K1,ARRD                              00027610
           ASSIGN     27,K0                                    00027620
           TRANSFER   ,ARRE                                    00027630
     ARRD  GATE LS    21,ARRF                                  00027640
     ARRE  LOGICR     21                                       00027650
           TEST NE    P35,999,ARRG                             00027660
           TEST L     V147,V234,ARM17    GENERAL               00027670
           TEST L     V11,V236,ARM17                           00027680
           TEST L     V148,V235,ARM19    GENERAL               00027690
     ARRG  ASSIGN     17,2                                     00027700
           MARK       44                                       00027710
           ASSIGN     8,K0                                     00027720
           TRANSFER   SBR,LIA,5                                00027730
           TEST LE    V13,FN2,AARH                             00027740
           ASSIGN     35,0                                     00027750
           TRANSFER   ,TSTHP                                   00027760
     ARRF  GATE LR    1,AAB                                    00027770
           TEST NE    P17,K16,AAB                              00027780
           TEST E     BV11,K1,AAB                              00027790
           TEST GE    MX1(1,3),K1,AAB    GENERAL               00027800
           TRANSFER   ,DLB                                     00027810
     AARH  ASSIGN     27,K1                                    00027820
           ASSIGN     19,2                                     00027830
           TRANSFER   ,CMA                                     00027840
     *                                                         00027850
     *                                                         00027860
     *                                                         00027870
     *                                                         00027880
     *  NORS/CANNIBALIZATION ROUTINE                           00027890
     *                                                         00027900
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  NORCA TEST LE    RN6,FN48,NORA            11.12.74    00027910
        ASSIGN     1,V61                                00027920
        TABULATE   10                                   00027930
        ASSIGN     18,K1                                00027940
        SPLIT      1,RLARF,,25                          00027950
        ADVANCE    P1                                   00027960
        TEST E     BV19,K1   TEST FOR PREVENTING OFF SHIFT MAINT.  00027970
        SAVEVALUE  V232+,M1                             00027980
        SAVEVALUE  1425+,M1                             00027990
        SPLIT      1,RLARG,,25                          00028000
        TRANSFER   ,MPAA                                00028010
  NORCB SPLIT      1,NORCD                              00028020
        TRANSFER   ,NORCE                               00028030
  NORCD ADVANCE    P1                                   00028040
        TRANSFER   ,CAND                                00028050
   NORA ASSIGN     23,74                                00028060
        TEST E     V62,CH2B                             00028070
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                TEST E      W$NORL,KO                                    00028080
                ASSIGN      1,KO                                         00028090
                GATE LS     22,NORC                                      00028100
                GATE LR     23                                           00028110
                SCAN        12,14,P14,,,NORM                             00028120
                SPLIT       1,NORT,,60                                   00028130
                SPLIT       1,NORS,,60                                   00028140
                SPLIT       1,RLARF,,60                                  00028150
                TRANSFER    ,NORJ                                        00028160
        CANO    ASSIGN      17,K22                                       00028170
                TRANSFER    ,CANP                                        00028180
        NORT    UNLINK      28,NORL,1,14,P14                             00028190
        NORG    PRIORITY    110                                          00028200
        NORN    JOIN        11                                           00028210
        NORH    LINK        29,FIFO                                      00028220
        NORM    LOGICS      23                                           00028230
                TEST E      W$NORL,KO                                    00028240
        NORB    UNLINK      28,CANA,1,,,NORE                             00028250
                SAVEVALUE   75,KO,H                                      00028260
                SAVEVALUE   *23,P22,H                                    00028270
                GATE LS     24                                           00028280
                LOGICR      24                                           00028290
                TEST E      XH75,KO,NORB                                 00028300
                ASSIGN      1,XH76                                       00028310
                UNLINK      29,CANB,1,14,P1                              00028320
                BUFFER                                                   00028330
        NORCE   TABULATE    11                                           00028340
                MSAVEVALUE  5+,V46,2,K1,H                                00028350
                LOGICR      23                                           00028360
                ASSIGN      19,K14                                       00028370
                TABULATE    0                                            00028380
                ASSIGN      1,K5431                                      00028390
        CANP    ASSIGN      3,V54                                        00028400
                ASSIGN      2,V270                                       00028410
                ASSIGN      4,V55                                        00028420
                TEST E      V269,0,SIK1        FOR 2ND W.C.              00028421
        SIK4    TEST L      P4,K1,CANE         12.12.74 WAS K5           00028430
                ASSIGN      4,K1               12.12.74 WAS K5           00028440
        CANE    QUEUE       V27                                          00028450
                QUEUE       44                                           00028460
        CANH    GATE LR     20,CANF                                      00028470
                ASSIGN      7,V28                                        00028480
                ASSIGN      20,V35                                       00028510
                ASSIGN      55,CANE            10.23.74                  00028511
                TEST G      P20,0,PMCN1        10.23.74                  00028512
                ASSIGN      8,K1                                         00028520
        CANG    TEST GE     R*7,P3,CANJ                                  00028530
                TEST LE     P4,P20,CANL                                  00028540
        CANK    DEPART      V27                                          00028550
                DEPART      44                                           00028560
                ENTER       *7,P3                                        00028570
                ADVANCE     P4                                           00028580
                LEAVE       *7,P3                                        00028590
                UNLINK      P7,UNLK,ALL                                  00028600
                ASSIGN      17,24                                        00028610
                MSAVEVALUE  2+,P2,P17,V36                                00028620
                SAVEVALUE   V63+,V36                                     00028630
                SAVEVALUE   61+,V36                                      00028640
                MSAVEVALUE  5+,V46,2,V36                                 00028650
                TEST E      P26,KO,CANM                                  00028660
                TEST NE     P5,K9999,CANN      FOR 2ND W.C.              00028661
                TEST E      P1,K5431,CANN                                00028670
                TRANSFER    ,MPAA                                        00028680
        NORS    ASSIGN      18,K1                                        00028690
                TABULATE    10                                           00028700
                LINK        30,FIFO                                      00028710
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NORC    LOGICS      22                                                      00028720
NORD    TABULATE    10                                                      00028730
        SPLIT       1,NORG,,60                                              00028740
        SPLIT       1,RLARF,,60                                             00028750
        SPLIT       1,NORJ,,60                                              00028760
        ASSIGN      18,K1                                                   00028770
NORL    PRIORITY    10,BUFFER                                               00028780
        ASSIGN      2,MX4(1,P14)                                            00028790
        JOIN        12                                                      00028800
NORF    LINK        28,P2                                                   00028810
NORE    LOGICR      23                                                      00028820
        BUFFER                                                              00028830
        TRANSFER    ,NORU                                                   00028840
CANB    SPLIT       1,NORN,,60                                              00028850
        ASSIGN      22,XH*23                                                00028860
        SPLIT       1,NORN,,60                                              00028870
NORJ    PRIORITY    50                                                      00028880
        ASSIGN      1,V61                                                   00028890
        ASSIGN      3,V64                                                   00028900
        TEST G      P3,MX4(1,P14),NORK                                      00028910
        MSAVEVALUE  4,1,*14,*3                                              00028920
NORK    ADVANCE     P1                                                      00028930
        ASSIGN      19,K15                                                  00028940
        TABULATE    6                                                       00028950
        TABULATE    12                                                      00028960
        GATE LR     25                                                      00028970
        TEST E      V62,CH28                                                00028980
        LOGICS      25                                                      00028990
        SAVEVALUE   62,P22                                                  00029000
        UNLINK      28,NORP,ALL                                            00029010
        GATE LR     25                                                      00029020
        GATE LS     26,CAND                                                 00029030
        LOGICR      26                                                      00029040
CANN    TERMINATE                                                           00029050
CANC    LOGICS      24                                                      00029060
        TEST E      P22,XH*23,NORH                                          00029070
        SAVEVALUE   75,K1,H                                                 00029080
        TRANSFER    ,NORH                                                   00029090
NORQ    JOIN        10                                                      00029100
        GATE LR     27                                                      00029110
        GATE LS     28,NORR                                                 00029120
        TEST E      P22,X62,NORR                                            00029130
        LOGICR      28                                                      00029140
        TERMINATE                                                           00029150
NORR    REMOVE      10                                                      00029160
        PRIORITY    110                                                     00029170
        TRANSFER    ,NORH                                                   00029180
CANA    ASSIGN      24,XH*23                                                00029190
        UNLINK      29,CANC,ALL,14,P14                                     00029200
        SAVEVALUE   76,P14,H                                                00029210
        PRIORITY    110,BUFFER                                              00029220
        GATE LR     23                                                      00029230
        TRANSFER    ,NORL                                                   00029240
NORP    GATE LS     25,NORF                                                 00029250
        LOGICS      27                                                      00029260
        UNLINK      29,NORQ,ALL,14,P14                                     00029270
        BUFFER                                                              00029280
        SCAN        10,22,X62,,,NORU                                        00029290
        LOGICS      28                                                      00029300
        LOGICR      27                                                      00029310
        LOGICR      25                                                      00029320
        TEST E      G10,K1,NORF                                             00029330
        ASSIGN      22,X62                                                  00029340
NORW    LOGICS      26                                                      00029350
        TEST E      BV19,K1   TEST FOR PREVENTING OFF SHIFT MAINT.          00029360
        SAVEVALUE   63+,M1                                                  00029370
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              SAVEVALUE    V232+,M1           THESE SAVEVALUES SHOULD ACCOUNT    00029380
              SAVEVALUE    1425+,M1           FOR NORS BY A/C + CO.             00029390
              UNLINK       30,NORX,ALL,14,P14                                   00029400
              REMOVE       12                                                   00029410
    NORX      SPLIT        1,RLARG                                              00029420
              TRANSFER     ,MPAA                                                00029430
    NORU      LOGICR       27                                                   00029440
              GATE LR      25                                                   00029450
              TRANSFER     ,NORF                                                00029460
    CANF      ASSIGN       7,V27                                                00029470
              ASSIGN       20,V38                                               00029480
              ASSIGN       8,K0                                                 00029490
              TRANSFER     ,CANG                                                00029500
    CANJ      ASSIGN       23,FN7                                               00029510
              ASSIGN       21,CANH                                              00029520
              LINK         P7,P23                                               00029530
    CANL      ASSIGN       19,V39                                               00029540
              ASSIGN       4,P20                                                00029550
              ASSIGN       26,K1                                                00029560
              TEST E       P4,K0,CANK                                           00029570
              DEPART       V27                                                  00029580
              DEPART       44                                                   00029590
              PRIORITY     1,BUFFER                                             00029600
              PRIORITY     90                                                   00029610
    CANM      ASSIGN       4,P19                                                00029620
              ASSIGN       26,K0                                                00029630
              TRANSFER     ,CANE                                                00029640
    SIKI      SPLIT        1,SIK3,,60         FOR 2ND W.C.                      00029641
              TRANSFER     ,SIK4              FOR 2ND W.C.                      00029642
    SIKJ      ASSIGN       5,K9999            FOR 2ND W.C.                      00029643
              ASSIGN       3,V53              FOR 2ND W.C.                      00029644
              ASSIGN       2,V269             FOR 2ND W.C.                      00029645
              TRANSFER     ,SIK4              FOR 2ND W.C.                      00029646
    EDSIM     ADVANCE      V245                                          1.27   00029647
              ASSIGN       14,X191                                       1.27   00029648
    ACNUM     JOIN         13                                            1.27   00029650
              SCAN E       13,14PF,PF14,10PF,10PF,HER                    1.27   00029651
              TEST NE      P10,0,HER                                     1.27   00029652
              SAVEVALUE    1660+,V243                                    1.27   00029653
              SAVEVALUE    V244+,V243                                    1.27   00029654
    HER       LOOP         14,ACNUM                                      1.27   00029655
              TERMINATE                                                  1.27   00029656
    *                                                                           00029660
    *                                                                           00029670
    *                                                                           00029680
    * SERVICE PLATOON, DIRECT SUPPORT, GENERAL SUPPORT COMP REPAIR              00029690
    *                                                                           00029700
    IMAH      ASSIGN       0,K6                                                 00029710
              TRANSFER     ,IMAG                                                00029720
    IMAA      ASSIGN       4,V65                                                00029730
              TABULATE     13                                                   00029740
              TABULATE     14                                                   00029750
              TEST LE      V139,RN3,ARM6                                        00029760
              TEST LE      V140,RN1,ARM7                                        00029770
              TEST NE      V66,K0,IMAH                                          00029780
              TEST L       P4,K6,IMAB                                           00029790
              ASSIGN       4,K6                                                 00029800
    IMAB      QUEUE        45                                                   00029810
    IMAC      GATE SNF     FN49,IMAD                                            00029820
              DEPART       45                                                   00029830
              ENTER        FN49                                                 00029840
              ASSIGN       32,V67                                               00029850
              QUEUE        V68                                                  00029860
    IMAF      TEST GE      R*32,P31,IMAE                                        00029870
              DEPART       V68                                                  00029880
              ENTER        *32,P31                                              00029890
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        SAVEVALUE    V69+,V70                                      00029900
        SAVEVALUE    75+,V70                                       00029910
        ADVANCE      P4                                            00029920
        LEAVE        FN49                                          00029930
        LEAVE        *32,P31                                       00029940
        UNLINK       31,IMAC,ALL                                   00029950
        UNLINK       55,IMAF,ALL,32,P32                            00029960
        ASSIGN       6,K3                                          00029970
        SAVEVALUE    77,RN7,H                                      00029980
        TEST L       XH77,V71,ARM45                                00029990
        ASSIGN       6+,K3                                         00030000
        TEST G       XH77,V72,ARM46                                00030010
        ASSIGN       6-,K2                                         00030020
        TEST G       XH77,V73,ARM47                                00030030
        ASSIGN       6+,K1                                         00030040
        SAVEVALUE    182+,K1                                       00030050
IMAG    MSAVEVALUE   5+,V46,*6,K1,H                                00030060
        MSAVEVALUE   5+,V46,*6,V70                                 00030070
        SAVEVALUE    V193+,V70                                     00030080
        SAVEVALUE    650+,V70                                      00030090
        SAVEVALUE    V192+,V70                                     00030100
        SAVEVALUE    1250+,V70                                     00030110
        TEST E       P6,K6,SMGQ                                    00030120
DEPA    TABULATE     15                                            00030130
        TERMINATE                                                  00030140
ARM45   SAVEVALUE    179+,K1                                       00030150
        TRANSFER     ,IMAG                                         00030160
ARM46   SAVEVALUE    180+,K1                                       00030170
        TRANSFER     ,ARM26                                        00030180
ARM47   SAVEVALUE    181+,K1                                       00030190
        TRANSFER     ,ARM26                                        00030200
ARM6    ASSIGN       12,                                          00030210
        PRIORITY     0                                             00030220
        ASSIGN       29,P31                                        00030230
        ASSIGN       30,K0                                         00030240
        TEST E       P28,K5,ARM8                                   00030250
        ASSIGN       26,K2                                         00030260
ARM9    ASSIGN       27,0                                          00030270
        ASSIGN       17,18                                         00030280
        ASSIGN       6,7                                           00030290
        SAVEVALUE    177+,K1                                       00030300
        MSAVEVALUE   5+,V46,*6,K1,H                                00030310
        TRANSFER     ,UNSJ                                         00030320
ARM8    ASSIGN       26,3                                          00030330
        TRANSFER     ,ARM9                                         00030340
IMAD    LINK         31,FIFO                                       00030350
IMAE    LINK         55,FIFO                                       00030360
ARM7    ASSIGN       32,V141                                       00030370
        QUEUE        V142                                          00030380
ARM13   TEST GE      R*32,P31,ARM12                                00030390
        DEPART       V142                                          00030400
        ENTER        *32,P31                                       00030410
        SAVEVALUE    V143+,V70                                     00030420
        SAVEVALUE    107+,V70                                      00030430
        ADVANCE      F4                                            00030440
        LEAVE        *32,P31                                       00030450
        UNLINK       57,ARM13,ALL,32,P32                           00030460
        ASSIGN       6,8                                           00030470
        SAVEVALUE    178+,K1                                       00030480
        TRANSFER     ,IMAG                                         00030490
ARM12   LINK         57,FIFO                                       00030500
ARM26   ASSIGN       12,24                                         00030510
ARM27   TEST NE      P22,MH6(27,*12),ARM28                         00030520
        LOOP         12,ARM27                                      00030530
        TRANSFER     ,IMAG                                         00030540
ARM28   SPLIT        1,ARM29,,60                                   00030550
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         TRANSFER    ,IMAG                                           00030560
AKM29 TEST E    P6,MH6(26,*12),SMGQ                                  00030570
         MSAVEVALUE  6,*14,*12,V150,H                                00030580
         TERMINATE                                                   00030590
*                                                                    00030600
*                                                                    00030610
*                                                                    00030620
*                                                                    00030630
*  MANPOWER CONTROL ROUTINE                                          00030640
*                                                                    00030650
*                                                                    00030660
*     SHIFT TERMINATION SUBROUTINE                                   00030670
*                                                                    00030680
MPCA     PRIORITY    100                                             00030690
         SPLIT       1,MPCE,,25                                      00030700
         SPLIT       3,MPCB,2,25                                     00030710
MPCB     ASSIGN      3,MX3(*2,2)                                     00030720
         TEST GE     P3,K1,SMGQ                                      00030730
         ASSIGN      5,MX3(*2,3)                                     00030740
         ADVANCE     V74                                             00030750
MPCN     ASSIGN      1,K31                                          00030760
         SPLIT       22,MPCX,1,25                                    00030770
MPCC     LOGICS      29                                             00030780
         SPLIT       1,MPCD,,25                                      00030790
         ADVANCE     P5                                             00030800
         UNLINK      56,SMGQ,1,13                                    00030810
         UNLINK      56,MPCF,1,13,,MPCG                              00030820
         ADVANCE     P3                                             00030830
         TRANSFER    ,MPCC                                           00030840
MPCX     TEST L      R*1,K900,SMGQ                                   00030850
         TEST E      S*1,K0,MPCJA                                    00030860
MPCL     ASSIGN      11,R*1                                          00030870
         ENTER       *1,P11                                          00030880
         GATE LR     29                                             00030890
         LEAVE       *1,P11                                          00030900
         TERMINATE                                                   00030910
MPCK     ASSIGN      15,V76                                          00030920
         ASSIGN      8,P15                                           00030930
MPCJB SPLIT       1,MPCL,,25                                         00030940
         ASSIGN      21,MPCM                                         00030950
         ASSIGN      23,K1                                          00030960
         LINK        P1,P23                                          00030970
MPCD     LINK        56,FIFO                                        00030980
MPCF     TRANSFER    ,MPCD                                           00030990
MPCM     TEST E      P8,R*1,MPCK                                     00031000
         TRANSFER    ,MPCL                                           00031010
MPCG     LOGICR      29                                             00031020
         ADVANCE     P3                                             00031030
         UNLINK      56,MPCF,1,13,,MPCN                              00031040
         TRANSFER    ,MPCC                                           00031050
MPCJA ASSIGN      8,S*1                                              00031060
         TRANSFER    ,MPCJB                                          00031070
*                                                                    00031080
*                                                                    00031090
*     SHIFT CHANGE SUBROUTINE                                        00031100
*                                                                    00031110
MPCE     ASSIGN      3,MX3(1,1)                                      00031120
         ASSIGN      2,MX3(2,1)                                      00031130
         ADVANCE     MX3(1,4)                                        00031140
MPCJ     LOGICI      20                                             00031150
         GATE LR     30,MPCAA                                        00031160
         LOGICI      30                                             00031170
         ASSIGN      4,11                                           00031180
MPCAB UNLINK      V77,UNLK,ALL                                       00031190
         LOOP        4,MPCAB                                         00031200
MPCAD ADVANCE     P3                                                 00031210
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        TRANSFER     ,MPCJ                                           00031220
MPCAA   LOGIC1       30                                              00031230
        ASSIGN       4,11                                            00031240
MPCAC   UNLINK       V78,UNLK,ALL                                    00031250
        LOOP         4,MPCAC                                         00031260
        ADVANCE      P2                                              00031270
        ADVANCE      V145                                            00031280
        TRANSFER     ,MPCJ                                           00031290
*                                                                    00031300
*                                                                    00031310
* DATA COMPILATION ROUTINE                                           00031320
*                                                                    00031330
DCRA    ASSIGN       3,MX1(5,1)                                      00031340
        PRIORITY     1,BUFFER                                        00031350
        ADVANCE      V9              RUN TIME MINUS 2                00031370
        MSAVEVALUE   1,6,11,V84                                      00031400
        ASSIGN       5,11                                            00031410
ARM35   ASSIGN       1,V178                                         00031420
        ASSIGN       2,V179                                         00031430
        ASSIGN       3,V180                                         00031440
        ASSIGN       4,V181                                         00031450
        SAVEVALUE    V177+,V182                                     00031460
        SAVEVALUE    V188+,V182                                     00031470
        LOOP         5,ARM35                                         00031480
        SAVEVALUE    550+,V183                                      00031490
        SAVEVALUE    1150+,V183                                     00031500
        ASSIGN       6,K1                                            00031510
        ASSIGN       1,526                                           00031520
        ASSIGN       2,551                                           00031530
        ASSIGN       3,251                                           00031540
        ASSIGN       4,776                                           00031550
        ASSIGN       5,1451                                          00031560
ARM44   ASSIGN       7,V212                                         00031570
        SAVEVALUE    V193,V213                                      00031580
        TEST E       P6,X191,ARM43                                  00031590
        SAVEVALUE    650,V214                                       00031600
        SAVEVALUE    183,V215                                       00031610
        ASSIGN       2,699                                           00031620
        ASSIGN       3,1424           ESTABLISH SAVEVALUE NOS. FOR NORS /AVAIL.   00031630
        ASSIGN       1,674                                           00031640
ARM49   SAVEVALUE    *2,V216                                        00031650
        ASSIGN       2-,K1                                           00031660
        ASSIGN       3-,K1            SET UP SAVE NOS FOR NORS TO CALC. AVAIL   00031670
        TEST NE      P1,651,ARM48                                   00031680
        LOOP         1,ARM49                                         00031690
        TERMINATE                                                    00031700
ARM48   SAVEVALUE    700,V217                                       00031710
        ASSIGN       1,226                                           00031720
        ASSIGN       2,1426                                          00031730
        ASSIGN       3,201                                           00031740
        ASSIGN       4,701                                           00031750
ARM50   SAVEVALUE    *4,V219                                        00031760
        TEST NE      P4,724,ARM51                                   00031770
        ASSIGN       1+,1                                            00031780
        ASSIGN       2+,1                                            00031790
        ASSIGN       3+,1                                            00031800
        ASSIGN       4+,1                                            00031810
        TRANSFER     ,ARM50                                         00031820
ARM51   SAVEVALUE    725,V220                                       00031830
        ASSIGN       1,226                                           00031840
        ASSIGN       2,201                                           00031850
        ASSIGN       3,726                                           00031860
ARM52   SAVEVALUE    *3,V218                                        00031870
        TEST NE      P3,750,ARM53                                   00031880
        ASSIGN       1+,1                                            00031890
        ASSIGN       2+,1                                            00031900
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        ASSIGN      3+,1                                00031910
        TRANSFER    ,ARM52                              00031920
ARM53 SAVEVALUE    750,V221                             00031930
        ASSIGN      2,K11                               00031940
DCRB  ASSIGN      3,MX1(6,P2)                           00031950
        TEST GE     P3,K1,DCRC                          00031960
        ASSIGN      17,25                               00031970
        MSAVEVALUE  2+,P2,P17,P3                        00031980
        SAVEVALUE   20+,P3                              00031990
        SAVEVALUE   V30+,P3                             00032000
DCRC  LOOP        2,DCRB                                00032010
        TEST E      MX1(5,8),K0,DCRE                    00032020
DCRD  UNLINK      27,REAA,ALL                          00032030
        UNLINK      28,REAB,ALL                         00032040
DCRE  BUFFER                                            00032050
        ASSIGN      2,25                                00032060
DCRG  ASSIGN      3,K14                                 00032070
DCRF  ASSIGN      5,MX2(*3,*2)                          00032080
        MSAVEVALUE  2+,15,*2,*5                         00032090
        LOOP        5,DCRF                              00032100
        LOOP        2,DCRG                              00032110
REED  TRANSFER    ,RELA                                 00032120
ARM43 ASSIGN      1+,K1                                 00032130
        ASSIGN      2+,K1                               00032140
        ASSIGN      3+,K1                               00032150
        ASSIGN      4+,K1                               00032160
        ASSIGN      5+,K1                               00032170
        ASSIGN      6+,K1                               00032180
        TRANSFER    ,ARM44                              00032190
REEA  SAVEVALUE   185,V229                             00032200
        SAVEVALUE   186,V230                            00032210
        TERMINATE   1                                   00032230
REAA  ASSIGN      2,K3                                  00032240
        ASSIGN      3,MX1(5,7)                          00032250
        MSAVEVALUE  2+,4,17,P3                          00032260
        SAVEVALUE   V37+,P3                             00032270
        SAVEVALUE   32+,P3                              00032280
REEG  SAVEVALUE   90+,M1                               00032290
        SAVEVALUE   187+,M1                             00032300
        SAVEVALUE   V185+,M1                            00032310
        SAVEVALUE   600+,M1                             00032320
        SAVEVALUE   V184+,M1                            00032330
        SAVEVALUE   1200+,M1                            00032340
        SAVEVALUE   V195+,M1                            00032350
        SAVEVALUE   675+,M1                             00032360
        SAVEVALUE   V194+,M1                            00032370
        SAVEVALUE   1275+,M1                            00032380
        TERMINATE                                       00032390
REAB  TABULATE    9                                    00032400
        SAVEVALUE   36+,M1                              00032410
        SAVEVALUE   63+,M1                              00032420
        TERMINATE                                       00032430
PMCB  TERMINATE                                         00032440
DATA  PRIORITY    0                                    00032450
        ADVANCE     K60                                 00032460
DATA1 ASSIGN      2,K4                                  00032470
DATA2 ADVANCE     230                                  00032480
        TEST E      V224,K0,DATA4                       00032490
DATA3 ADVANCE     K10                                  00032500
        LOOP        2,DATA2                             00032510
        ADVANCE     K710                                00032520
        TEST E      V224,K0,DATA6                       00032530
DATA5 ADVANCE     K10                                  00032540
        TRANSFER    ,DATA1                              00032550
DATA4 SAVEVALUE   188-,V225                            00032560
        SAVEVALUE   187-,V227                           00032570
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         TRANSFER    ,DATA3                                              00032580
 DATA6 SAVEVALUE     188-,V226                                           00032590
         SAVEVALUE   187-,V228                                           00032600
         TRANSFER    ,DATA5                                              00032610
         RMULT       ,,,,,,,31                                           00032620
         START       1,,,1                                               00032630
         REPORT                                                          00032640
         EJECT                                                           00032654
         SPACE       3                                                   00032660
 57    TEXT       ARMY R + M SIMULATION MODEL                            00032670
 57    TEXT       ------------------------------                         00032680
         SPACE       2                                                   00032690
 2     TEXT       SCENARIO SIMULATED                                     00032700
         SPACE       1                                                   00032710
 4     TEXT       ONE PLATOON OF NINE CH-54B ARMY HELICOPTERS            00032720
         SPACE       1                                                   00032730
 4     TEXT       FLYING PROGRAM CONSISTED OF FIVE FLYING DAYS PER WEEK  00032740
         SPACE       1                                                   00032760
 4     TEXT       MISSION LENGTH IS 1.8 HOURS                           00032770
         SPACE       1                                                   00032790
 4     TEXT       LAUNCH SCHEDULE DURING EACH FLYING DAY                 00032800
 6     TEXT                                                              00032810
 6     TEXT                                                              00032820
 6     TEXT                                                              00032830
 6     TEXT                                                              00032840
 6     TEXT                                                              00032850
         SPACE       1                                                   00032860
 4     TEXT       OTHER FLIGHT CONSIDERATIONS                            00032870
         SPACE       1                                                   00032871
 6     TEXT       STANDBY AIRCRAFT READY AT ALL TIMES DURING THE SCHEDU*00032880
 LED FLYING INTERVALS.                                                  00032890
         SPACE       1                                                   00032891
 6     TEXT       MISSION FLIGHT IS POSSIBLE UP TO THIRTY MINUTES AFTER*00032900
 SCHEDULED FLIGHT TIME. AFTER THIS INTERVAL, FLIGHT IS SCRUBBED.        00032910
         SPACE       2                                                   00032920
 2     TEXT       MAINTENANCE CONCEPT SIMULATED                          00032930
         SPACE       1                                                   00033000
 4     TEXT       PREVENTIVE MAINTENANCE DAILY (PMD) INSPECTIONS OCCUR *00033010
 DAILY IF THE AIRCRAFT HAS FLOWN OR EVERY 72 HOURS IF NOT FLYING.       00033020
         SPACE       1                                                   00033030
 4     TEXT       INTERMEDIATE MAINTENANCE INSPECTIONS OCCUR EVERY 25 H*00033031
 OURS.                                                                  00033032
         SPACE       1                                                   00033033
 4     TEXT       PERIODIC MAINTENANCE INSPECTIONS OCCUR EVERY 100 HOUR*00033034
 S.                                                                     00033035
         SPACE       2                                                   00033036
 4     TEXT       MAINTENANCE PERSONNEL ARE AVAILABLE BETWEEN 0830 AND *00033040
 1630 DURING THE FIVE DAY FLYING PERIOD PER WEEK.                       00033050
         SPACE       1                                                   00033060
         SPACE       1                                                   00033090
 4     TEXT       THE AIRCRAFT CONSISTS OF 295 ELEMENTS. THERE ARE 21 T*00033100
 IME CHANGE COMPONENTS.                                                 00033110
         SPACE       1                                                   00033120
 4     TEXT       ORGANIZATIONAL MAINTENANCE INCLUDES AN INTEGRATED DIR*00033160
 ECT SUPPORT MAINTENANCE CAPABILITY.                                    00033170
         SPACE       1                                                   00033180
 4     TEXT       OFF EQUIPMENT COMPONENT MAINTENANCE IS DUMMIED OUT.    00033190
         SPACE       1                                                   00033220
 4     TEXT       CONDEMNATION OR NRTS STATUS IS DUMMIED OUT.            00033230
         SPACE       1                                                   00033240
 4     TEXT       NORS AND CANNIBALIZATION ROUTINE IS ACTIVE.            00033241
         SPACE       2                                                   00033242
 2     TEXT       EVALUATION THIS SIMULATION RUN:                        00033250
         SPACE       1                                                   00033260
 10    TEXT       BASIC CH-54B MISSION AND MAINTENANCE PHILOSOPHY        00033270
 10    TEXT                                                              00033271
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        SPACE     1                                                    00033272
 10     TEXT                                                           00033273
        SPACE     1                                                    00033274
        EJECT                                                          00033280
 19     TEXT                        MISSION                            00033290
        SPACE     1                                                    00033300
 19     TEXT                      INFORMATION                          00033310
*                              -----------------                       00033320
        SPACE     3                                                    00033330
 10     TEXT      AIRCRAFT           MISSIONS         MISSIONS     *00033340
    MISSION                                                            00033350
 10     TEXT      TAIL NUMBER        CALLED           FLOWN       *00033360
    FLYING HOURS                                                      00033370
        SPACE     3                                                    00033380
 10     TEXT         1            #X201,2/XXX#              #X226*00033390
,2/XXX#              #X251,2/1LXXX.X#                                 00033400
*                                                                     00033410
        SPACE     3                                                    00033420
 10     TEXT         2            #X202,2/XXX#              #X227*00033430
,2/XXX#              #X252,2/1LXXX.X#                                 00033440
        SPACE     3                                                    00033450
 10     TEXT         3            #X203,2/XXX#              #X228*00033460
,2/XXX#              #X253,2/1LXXX.X#                                 00033470
        SPACE     3                                                    00033480
 10     TEXT         4            #X204,2/XXX#              #X229*00033490
,2/XXX#              #X254,2/1LXXX.X#                                 00033500
        SPACE     3                                                    00033510
 10     TEXT         5            #X205,2/XXX#              #X230*00033520
,2/XXX#              #X255,2/1LXXX.X#                                 00033530
        SPACE     3                                                    00033540
 10     TEXT         6            #X206,2/XXX#              #X231*00033550
,2/XXX#              #X256,2/1LXXX.X#                                 00033560
        SPACE     3                                                    00033570
 10     TEXT         7            #X207,2/XXX#              #X232*00033580
,2/XXX#              #X257,2/1LXXX.X#                                 00033590
        SPACE     3                                                    00033600
 10     TEXT         8            #X208,2/XXX#              #X233*00033610
,2/XXX#              #X258,2/1LXXX.X#                                 00033620
        SPACE     3                                                    00033630
 10     TEXT         9            #X209,2/XXX#              #X234*00033640
,2/XXX#              #X259,2/1LXXX.X#                                 00033650
 10     TEXT      ---------------------------------------------------*00034110
        --------------------------------------------                  00034120
        SPACE     2                                                    00034130
 10     TEXT              TOTALS      #X225,2/XXXX#            #X250*00034140
,2/XXXX#             #X275,2/1LXXX.X#                                 00034150
        EJECT                                                          00034160
 19     TEXT                        SCHEDULED                          00034170
        SPACE     1                                                    00034180
 19     TEXT                 INSPECTION INFORMATION                    00034190
*                              -----------------                       00034200
        SPACE     3                                                    00034210
 4      TEXT      AIRCRAFT     PREFLIGHT       PREFLIGHT     DAILY   *00034220
    DAILY         PM1          PM1             PMP           PMP      00034230
 4      TEXT      TAIL         NUMBER OF       MAINT.        NUMBER OF *00034240
    MAINT.        NUMBER OF    MAINT           NUMBER OF     MAINT    00034250
 4      TEXT      NUMBER       INSPECTION      MAN HRS.      INSPECTION*00034260
    MAN HRS.      INSPECTION   MAN HRS.        INSPECTION    MAN HR   00034270
        SPACE     3                                                    00034280
 3      TEXT         1            #X276,2/XXX#        #X301,2/2LXXX.X*00034290
X#              #X326,2/XXX#        #X351,2/2LXXX.XX#                  00034300
 78     TEXT      #X376,2/XXX#        #X401,2/2LXXX.XX#          #X*00034310
426,2/XXX#          #X451,2/2LXXX.XX#                                 00034320
        SPACE     3                                                    00034330
 3      TEXT         2            #X277,2/XXX#        #X302,2/2LXXX.X*00034340
X#        .    #X327,2/XXX#        #X352,2/2LXCCC.XX#           00034350
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16      TEXT        #X377,2/XXX#              #X402,2/2LXXX.XX#              #X*00034360
427,2/XXX#          #X452,2/2LXXX.XX#                                       00034370
        SPACE       3                                                       00034380
3       TEXT        3            #X278,2/XXX#              #X303,2/2LXXX.X*00034390
X#          #X328,2/XXX#              #X353,2/2LXXX.XX#                      00034400
78      TEXT        #X378,2/XXX#              #X403,2/2LXXX.XX#              #X*00034410
428,2/XXX#          #X453,2/2LXXX.XX#                                       00034420
        SPACE       3                                                       00034430
3       TEXT        4            #X279,2/XXX#              #X304,2/2LXXX.X*00034440
X#          #X329,2/XXX#              #X354,2/2LXXX.XX#                      00034450
78      TEXT        #X379,2/XXX#              #X404,2/2LXXX.XX#              #X*00034460
429,2/XXX#          #X454,2/2LXXX.XX#                                       00034470
        SPACE       3                                                       00034480
3       TEXT        5            #X280,2/XXX#              #X305,2/2LXXX.X*00034490
X#          #X330,2/XXX#              #X355,2/2LXXX.XX#                      00034500
78      TEXT        #X380,2/XXX#              #X405,2/2LXXX.XX#              #X*00034510
430,2/XXX#          #X455,2/2LXXX.XX#                                       00034520
        SPACE       3                                                       00034530
3       TEXT        6            #X281,2/XXX#              #X306,2/2LXXX.X*00034540
X#          #X331,2/XXX#              #X356,2/2LXXX.XX#                      00034550
78      TEXT        #X381,2/XXX#              #X406,2/2LXXX.XX#              #X*00034560
431,2/XXX#          #X456,2/2LXXX.XX#                                       00034570
        SPACE       3                                                       00034580
3       TEXT        7            #X282,2/XXX#              #X307,2/2LXXX.X*00034590
X#          #X332,2/XXX#              #X357,2/2LXXX.XX#                      00034600
78      TEXT        #X382,2/XXX#              #X407,2/2LXXX.XX#              #X*00034610
432,2/XXX#          #X457,2/2LXXX.XX#                                       00034620
        SPACE       3                                                       00034630
3       TEXT        8            #X283,2/XXX#              #X308,2/2LXXX.X*00034640
X#          #X333,2/XXX#              #X358,2/2LXXX.XX#                      00034650
78      TEXT        #X383,2/XXX#              #X408,2/2LXXX.XX#              #X*00034660
433,2/XXX#          #X458,2/2LXXX.XX#                                       00034670
        SPACE       3                                                       00034680
3       TEXT        9            #X284,2/XXX#              #X309,2/2LXXX.X*00034690
X#          #X334,2/XXX#              #X359,2/2LXXX.XX#                      00034700
78      TEXT        #X384,2/XXX#              #X409,2/2LXXX.XX#              #X*00034710
434,2/XXX#          #X459,2/2LXXX.XX#                                       00034720
16      TEXT        ----------------------------------------------------*00035490
---------------------------------------------                              00035500
*                                                                          00035510
*                                                                          00035520
4       TEXT        TOTALS       #X300,2/XXXX#            #X325,2/2LXXXX.XX*00035540
*           #X350,2/XXXX#             #X375,2/2LXXXX.XX#                     00035550
78      TEXT        #X400,2/XXX#              #X425,2/2LXXXX.XX#            #X*00035560
450,2/XXX#          #X475,2/2LXXXX.XX#                                      00035570
        EJECT                                                               00035580
        SPACE       3                                                       00035590
19      TEXT                             MAINTENANCE                       00035600
        SPACE       1                                                       00035610
19      TEXT                             INFORMATION                       00035620
        SPACE       3                                                       00035630
4       TEXT        AIRCRAFT     NUMBER OF MAINT ACTIONS       MAINTENANC*00035640
E MAN HOURS         ELAPSED MAINT. DOWNTIME                                 00035650
4       TEXT        TAIL                                                    00035660
4       TEXT        NUMBER      UNSCHEDULED      SCHEDULED     UNSCHEDULE*00035670
D       SCHEDULED       UNSCHEDULED      SCHEDULED                          00035680
        SPACE       3                                                       00035690
5       TEXT        1            #X476,2/XXXX#            #X501,2/XXXX#     *00035700
#X551,2/2LXXXX.XX#          #X526,2/2LXXXX.XX#                              00035710
77      TEXT        #X601,2/1LXXXX.X#            #X576,2/1LXXXX.X#           00035720
        SPACE       3                                                       00035730
5       TEXT        2            #X477,2/XXXX#            #X502,2/XXXX#     *00035740
#X552,2/2LXXXX.XX#          #X527,2/2LXXXX.XX#                              00035750
77      TEXT        #X602,2/1LXXXX.X#            #X577,2/1LXXXX.X#           00035760
        SPACE       3                                                       00035770
5       TEXT        3            #X478,2/XXXX#            #X503,2/XXXX#     *00035780
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                 #X553,2/2L XXXX.XX#          #X528,2/2LXXXX.XX#                    00035790
77      TEXT     #X603,2/1LXXXX.X#          #X578,2/1LXXXX.X#                       00035800
        SPACE    3                                                                 00035810
5       TEXT     4              #X479,2/XXXX#              #X504,2/XXXX#           *00035820
                 #X554,2/2LXXXX.XX#          #X529,2/2LXXXX.XX#                     00035830
77      TEXT     #X604,2/1LXXXX.X#          #X579,2/1LXXXX.X#                       00035840
        SPACE    3                                                                 00035850
5       TEXT     5              #X480,2/XXXX#              #X505,2/XXXX#           *00035860
                 #X555,2/2LXXXX.XX#          #X530,2/2LXXXX.XX#                     00035870
77      TEXT     #X605,2/1LXXXX.X#          #X580,2/1LXXXX.X#                       00035880
        SPACE    3                                                                 00035890
5       TEXT     6              #X481,2/XXXX#              #X506,2/XXXX#           *00035900
                 #X556,2/2LXXXX.XX#          #X531,2/2LXXXX.XX#                     00035910
77      TEXT     #X606,2/1LXXXX.X#          #X581,2/1LXXXX.X#                       00035920
        SPACE    3                                                                 00035930
5       TEXT     7              #X482,2/XXXX#              #X507,2/XXXX#           *00035940
                 #X557,2/2LXXXX.XX#          #X532,2/2LXXXX.XX#                     00035950
77      TEXT     #X607,2/1LXXXX.X#          #X582,2/1LXXXX.X#                       00035960
        SPACE    3                                                                 00035970
5       TEXT     8              #X483,2/XXXX#              #X508,2/XXXX#           *00035980
                 #X558,2/2LXXXX.XX#          #X533,2/2LXXXX.XX#                     00035990
77      TEXT     #X608,2/1LXXXX.X#          #X583,2/1LXXXX.X#                       00036000
        SPACE    3                                                                 00036010
5       TEXT     9              #X484,2/XXXX#              #X509,2/XXXX#           *00036020
                 #X559,2/2LXXXX.XX#          #X534,2/2LXXXX.XX#                     00036030
77      TEXT     #X609,2/1LXXXX.X#          #X584,2/1LXXXX.X#                       00036040
16      TEXT     ------------------------------------------------------------     *00036660
                                                                                   00036670
        --------------------------------------------
4       TEXT     TOTALS         #X500,2/XXX#              #X525,2/XXX#            *00036690
                 #X575,2/2LXXXXX.XX#          #X550,2/2LXXXXX.XX#                   00036700
77      TEXT     #X625,2/1LXXXX.X#          #X600,2/1LXXXX.X#                       00036710
        EJECT                                                                      00036720
        SPACE    3                                                                 00036730
19      TEXT                            AIRCRAFT                                    00036740
        SPACE    1                                                                 00036750
19      TEXT                          CHARACTERISTICS                              00036760
*                                 ---------------------                            00036770
        SPACE    2                                                                 00036780
4       TEXT     AIRCRAFT        DIRECT         NOT            NOT               *00036790
                 AVAILABILITY                                                       00036800
4       TEXT     TAIL           MAINT. MAN      OPERATIONALLY  OPERATIONA*00036810
LLY     ----------------------------------------------                             00036820
4       TEXT     NUMBER         HOURS PER       READY-         READY-           *00036830
        UP TIME/       MISSIONS FLOWN/       MISSIONS COMP/                        00036840
4       TEXT                    FLIGHT HR.      MAINTENANCE    SUPPLY           *00036850
        TOTAL TIME     MISSIONS CALLED       MISSIONS CALLED                       00036860
*-----------------------------------------------------------------------------*00036870
        --------------------------------------------
        SPACE    2                                                                 00036890
5       TEXT     1              #X626,2/2LXX.XX#              #X651,2/1LXXXX.*00036900
X#              #X1401,2/1LXXXX.X#        #X676,2/2LXX.XX#                          00036910
76      TEXT     #X701,2/2LXXX.XX#                  #X726,2/2LXXX.XX#               00036920
        SPACE    2                                                                 00036930
5       TEXT     2              #X627,2/2LXX.XX#              #X652,2/1LXXXX.*00036940
X#              #X1402,2/1LXXXX.X#        #X677,2/2LXX.XX#                          00036950
76      TEXT     #X702,2/2LXXX.XX#                  #X727,2/2LXXX.XX#               00036960
        SPACE    2                                                                 00036970
5       TEXT     3              #X628,2/2LXX.XX#              #X653,2/1LXXXX.*00036980
X#              #X1403,2/1LXXXX.X#        #X678,2/2LXX.XX#                          00036990
76      TEXT     #X703,2/2LXXX.XX#                  #X728,2/2LXXX.XX#               00037000
        SPACE    2                                                                 00037010
5       TEXT     4              #X629,2/2LXX.XX#              #X654,2/1LXXXX.*00037020
X#              #X1404,2/1LXXXX.X#        #X679,2/2LXX.XX#                          00037030
76      TEXT     #X704,2/2LXXX.XX#                  #X729,2/2LXXX.XX#               00037040
        SPACE    2                                                                 00037050
5       TEXT     5              #X630,2/2LXX.XX#              #X655,2/1LXXXX.*00037060
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X#              #X1405,2/1LXXXX.X#      #X680,2/2LXX.XX#                          00037070
   76    TEXT    #X705,2/2LXXX.XX#                    #X730,2/2LXXX.XX#           00037080
         SPACE   2                                                               00037090
   5     TEXT    6            #X631,2/2LXX.XX#              #X656,2/1LXXXX.*00037100
X#              #X1406,2/1LXXXX.X#      #X681,2/2LXX.XX#                          00037110
   76    TEXT    #X706,2/2LXXX.XX#                    #X731,2/2LXXX.XX#           00037120
         SPACE   2                                                               00037130
   5     TEXT    7            #X632,2/2LXX.XX#              #X657,2/1LXXXX.*00037140
X#              #X1407,2/1LXXXX.X#      #X682,2/2LXX.XX#                          00037150
   76    TEXT    #X707,2/2LXXX.XX#                    *X732,2/2LXXX.XX#           00037160
         SPACE   2                                                               00037170
   5     TEXT    8            #X633,2/2LXX.XX#              #X658,2/1LXXXX.*00037180
X#              #X1408,2/1LXXXX.X#      #X683,2/2LXX.XX#                          00037190
   76    TEXT    #X708,2/2LXXX.XX#                    #X733,2/2LXXX.XX#           00037200
         SPACE   2                                                               00037210
   5     TEXT    9            #X634,2/2LXX.XX#              #X659,2/1LXXXX.*00037220
X#              #X1409,2/1LXXXX.X#      #X684,2/2LXX.XX#                          00037230
   76    TEXT    #X709,2/2LXXX.XX#                    #X734,2/2LXXX.XX#           00037240
   10    TEXT    ------------------------------------------------------------*00037850
-------------------------------------------------------------------          00037860
   4     TEXT    TOTALS       #X650,2/2LXX.XX#              #X675,2/1LXXXX*00037880
X.X#            #X1425,2/1LXXXXX.X#      #X700,2/2LXX.XX#                         00037890
   77    TEXT    #X725,2/2LXX.XX#                    #X750,2/2LXX.XX#            00037900
         EJECT                                                                   00037910
         SPACE   3                                                              00037920
   30    TEXT     PLATOON STATISTICS                                             00037930
         SPACE   3                                                              00037940
   15    TEXT    TOTAL FLYING HOURS                      #X183,2/1LX*00037950
XXX.X#                                                                           00037960
         SPACE   2                                                              00037970
   18    TEXT    FLYING HOURS-COMPLETED MISSIONS         #X275,2/1LX*00037980
XXX.X#                                                                           00037990
         SPACE   1                                                              00038000
   18    TEXT    FLYING HOURS-ABORTED MISSIONS           #X1475,2/1L*00038010
XXX.X#                                                                           00038020
         SPACE   1                                                              00038030
   18    TEXT    FLYING HOURS-TEST HOPS                   #X800,2/1LX*00038040
XX.X#                                                                            00038050
         SPACE   3                                                              00038060
   15    TEXT    THE SERVICE PLATOON PERFORMED #X176,2/XXX# ON AIRCRAF*00038070
T REPAIRS.                                                                       00038080
         SPACE   2                                                              00038090
   15    TEXT    THE SERVICE PLATOON ALSO REMOVED AND REPLACED #X175,2*00038100
/XXX# PARTS ON THE AIRCRAFT.                                                     00038110
         OUTPUT                                                                  00038290
         END                                                                     00038300
```

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APPENDIX V

FACTORIAL APPROACH TO SIMULATION MODEL SENSITIVITY ANALYSIS

The factorial approach incorporated into this study is a powerful method of optimizing the number of test simulation runs to provide the output statistics required for analysis.

The purposes of this appendix are to give the statistical background upon which the factorial analysis is based and to provide the tables and statistical evidence of significant effects observed in other output parameters studied and referred to in the main body of this report.

The first step is to develop an independent estimate of simulation or experimental error. Table III in this appendix and Table VIII in the main body of the report, show four separate computer runs under identical conditions, except that the random number seed was changed. The variation, or simulation error, associated with operational availability was computed from these four runs by the following formula:

$$\text{Variance} = \frac{\Sigma (x_i - \bar{x})^2}{N - 1}$$

where x_i is the individual observations, $\bar{x}$ is the mean of the observations, and N is the number of observations.

Therefore, the variance associated with the output statistic of operational availability is

$$\frac{(55.98 - 56.62)^2 + (58.48 - 56.62)^2 + (54.06 - 56.62)^2 + (57.95 - 56.62)^2}{4 - 1}$$

$$\frac{.410 + 3.460 + 6.554 + 1.769}{3} = \frac{12.193}{3} = 4.06$$

The second step is to see if the variation that occurs when a factor level is changed is consistent with this simulation variation, in which case there is no reason to believe that the change in the level of the factor produced any change in the output value. If the variation that occurs when a factor level is changed is significantly larger than the simulation variation, then there is sufficient statistical evidence to conclude that the change in the level of the factor has caused the observed change in the output parameter.

Consider the change in NORS level vs. the observed change in operational availability as shown in the following case. Note that these values are the ones recorded in Table XII.

TABLE XII. FACTORIAL ANALYSIS WORKSHEET FOR OPERATIONAL AVAILABILITY

x_1 Low NORS (-)	x_2 Low Fail.Rate (-)	x_3 Low Util. (-)	Avail. Values	Yates Algorithm		Effects Isolated	Average Effect	Value of Each Effect	Effect Nomenclature	Mean Square
-	-	-	70.63	131.62	253.49	485.21	$\frac{485.21}{8}$	60.65	Average Response	29429.59
+	-	-	60.99	121.87	231.72	-36.63	$\frac{-36.63}{4}$	-9.16	x_1 (NORS) Effect	151.??
-	+	-	66.90	123.77	-21.57	-25.57	$\frac{-25.57}{4}$	-6.39	x_2 (F.R.) Effect	81.??
+	+	-	54.97	107.95	-15.06	-3.05	$\frac{-3.05}{4}$	-.76	$x_1 x_2$ Interaction	1.??
-	-	+	65.46	-9.64	-9.75	-21.77	$\frac{-21.77}{4}$	-5.44	x_3 (Util.) Effect	59.??
+	-	+	58.31	-11.93	-15.82	6.51	$\frac{6.51}{4}$	1.63	$x_1 x_3$ Interaction	5.??
-	+	+	57.93	-7.15	-2.29	-6.0?	$\frac{-6.07}{4}$	1.52	$x_2 x_3$ Interaction	?.??
+	+	+	50.02	-7.91	-.76	1.53	$\frac{1.53}{4}$	.38	$x_1 x_2 x_3$ Interaction	.??

Reported Center Points 55.98 58.48 54.06 57.95   Mean = 56.62%   St. Dev. = 2.026   (3 Degrees of Freedom)

Critical Values For $F_{1,3}$ is 10.1 for $\alpha = .05$ Variance For Center Points = $(2.026)^2 = 4.05$
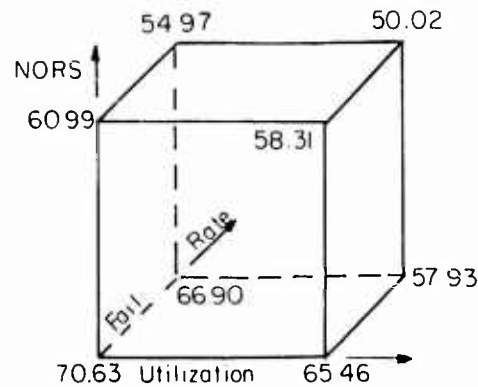
Figure 8. Observed Operational Availability Values

The Yates algorithm shown in Table XII is simply a mathematical procedure to facilitate the computation of effects. Using the availability values shown in Table XII and illustrated in Figure 8, the average effect on changing NORS level is

$$\frac{(60.99 - 70.63) + (54.97 - 66.90) + (58.31 - 65.46) + (50.02 - 57.93)}{4}$$

$$= \frac{-36.63}{4} = -9.16\% \text{ in operational availability}$$

Now the variation associated with this estimate is

$$\frac{(36.63)^2}{8} = 167.72$$

If there is no real change in operational availability caused by the change in NORS level, then this variability reflects simply the variability associated with simulation error, i.e., it is simply another estimate of simulation error.

The distribution generated by taking the quotient of two independent estimates of the same simulation error is given by the F distribution. The appropriate F distribution is dependent on the number of degrees of freedom associated with the numerator estimate and the denominator estimate.

Table XII shows that eight test points were used in generating the eight mean square values. There are eight separate bits of information used in the analysis; therefore, the data contains eight degrees of freedom. There are eight independent mean square outputs; therefore, there is one degree of freedom associated with each. In the case of the independent estimate of simulation error, there are four bits of data and therefore four degrees of freedom associated with the data; one is associated with estimating the

mean, $\bar{x}$, and the other three are associated with the estimate of error.

The NORS effect shows a variation value of 167.72 with df = 1, and the simulation variation value is 4.06 with df = 3. The $F_{1,3}$ distribution shows that at the α = .05 level of significance, given two independent estimates of the same error, the quotient of these two estimates should not exceed 10.1.

$$\frac{167.72}{4.06} = 41.31$$

Since this exceeds 10.1, we must conclude that the deviation or difference observed in operational availability when changing from a low to a high level of NORS is not simply a manifestation of simulation error, but in actuality is a true effect caused by this change in NORS level. The best estimate of this change is a -9.16% in operational availability.

The factorial analyses are performed for the following computer output values. Significant effects are asterisked in the table showing the factorial analyses, and these effects are summarized and discussed in the main body of the report.

1) Unscheduled Elapsed Maintenance Down Hours

2) NORS Plus Unscheduled Elapsed Maintenance Down Hours

3) Percentage of Intrinsic Availability for Flight Hours Divided by Flight Hours Plus Unscheduled Down Hours

4) Percentage of Intrinsic Availability for Flight Hours Divided by Flight Hours Plus Scheduled and Unscheduled Down Hours

5) Direct Maintenance Man-Hours Per Flight Hour

6) Percentage of Mission Accomplishment

7) NORS Down Hours

Table XII has been included to show the factorial analysis in detail. Table VIII in the main body of the report summarizes the factorial analysis findings for operational availability. Tables XIII through XIX summarize the findings for each of the seven model output statistics stated above.

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TABLE XIII. FACTORIAL ANALYSIS OF SCHEDULED ELAPSED MAINTENANCE : NU HOURS WITH NORS, FAILURE RATE, AND UTILIZATION AS FACTORS

X_1 Low NORS (−)	X_2 Low Fail.Rate (−)	X_3 Low Util. (−)		Yates Algorithm		Effects Isolated	Average Effect	Value of Each	Effect Nomenclature		Mean Square
−	−	−	4730	9511	20759	47909		5990	Average Response		—
+	−	−	4781	11279	27150	−212		−53	X_1 (NORS) Effect		
−	+	−	5507	12250	−55	−435		1152	X_2 (F.R.) Effect	**	
+	+	−	5572	14924	−134	311		78	$X_1 X_2$ Interaction		
−	−	+	6286	51	1767	6391		1098	X_3 (Util.) Effect	***	
+	−	+	5970	−136	2660	−49		−16	$X_1 X_3$ Interaction		
−	+	+	7371	−316	−187	901		225	$X_2 X_3$ Interaction		
+	+	+	7553	182	−98	665		172	$X_1 X_2 X_3$ Interaction		

| Reported Center Points | | | 6959.5 | 6960.3 | 6859.5 | 7562.0 | Mean = 7105.500 | St. Dev. = 360.94 | |
| Critical Values For $F_{1,3}$ | | | 5.54 for α = .10
 10.1 for α = .05
 34.1 for α = .01 | | | Variance For Center Points = 130,042.7 |

** Highly Significant
*** Very Highly Significant

TABLE XIV. FACTORIAL ANALYSIS OF NORS PLUS UNSCHEDULED ELAPSED MAINTENANCE DOWN HOURS WITH NORS, FAILURE RATE, AND UTILIZATION AS FACTORS

x_1 Low NORS (-)	x_2 Low Fail.Rate (-)	x_3 Low Util. (-)	Yates Algorithm			Effects Isolated	Average Effect	Value of Each Effect	Effect Nomenclature		Mean Square
-	-	-	19384	45973	100092	221350	221350/8	27669	Average Response		—
+	-	-	26589	54119	121258	32928	32928/8	8232	x_1 (NORS) Effect ***		
-	+	-	22304	53281	16716	22842	22842/2	5711	x_2 (F.R.) Effect **		
+	+	-	31815	67977	16212	2792	2792/4	698	$x_1 x_2$ Interaction		
-	-	+	22709	7205	8146	21166	21166/8	5292	x_3 (Util.) Effect **		
+	-	+	30572	9511	14696	-504	-504/4	-126	$x_1 x_3$ Interaction		
-	+	+	29814	7863	2306	6550	6550/4	1638	$x_2 x_3$ Interaction		
+	+	+	38163	8349	486	-1820	-1820/4	-455	$x_1 x_2 x_3$ Interaction		

Reported Center Points: 31298.8 | 28281.4 | 32390.4 | 31872.7   Mean = 30960.825   St. Dev. = 1844.58

Critical Values For F 1,3:
5.54 for α = .10
10.1 for α = .05
34.1 for α = .01

Variance For Center Points = (1844.580)² = 3,402,575

** Highly Significant
*** Very Highly Significant

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TABLE XV. FACTORIAL ANALYSIS OF % INTRINSIC AVAILABILITY (FLIGHT HOURS/FLIGHT HOURS + UNSCHEDULED DOWN HOURS) WITH NORS, FAILURE RATE, AND UTILIZATION AS FACTORS

x_1 Low NORS (-)	x_2 Low Fail.Rate (-)	x_3 Low Util. (-)	Yates Algorithm			Effects Isolated	Average Effect	Value of Each Effect	Effect Nomenclature		Mean Square
-	-	-	9.20	16.40	30.24	61.20	$\frac{61.20}{8}$	7.65	Average Response		-
+	-	-	7.20	13.84	30.96	-8.34	$\frac{-8.34}{4}$	-2.09	x_1 (NORS) Effect	***	6.69
-	+	-	7.99	17.33	-4.14	-6.26	$\frac{-6.26}{4}$	-1.57	x_2 (F.R.) Effect	**	4.90
+	+	-	5.85	13.63	-4.20	.76	$\frac{.76}{4}$	.19	$x_1 \times 2$ Interaction		.07
-	-	+	9.94	-2.00	-2.56	.72	$\frac{.72}{4}$	.18	x_3 (Util.) Effect		.06
+	-	+	7.39	-2.14	-3.70	- .06	$\frac{-.06}{4}$	- .02	$x_1 \times 3$ Interaction		.00
-	+	+	7.64	-2.55	- .14	-1.14	$\frac{-1.14}{4}$	- .29	$x_2 \times 3$ Interaction		.16
+	+	+	5.99	-1.65	.90	1.04	$\frac{1.04}{4}$	.26	$x_1 \times 2 \times 3$ Interaction		.14

| Reported Center Points | 6.66 | 7.43 | 6.52 | 6.45 | Mean = 6.7650, St. Dev. = .4518 | 3 Degrees of Freedom |

Critical Values For F $_{1,3}$ 5.54 for α = .10
10.1 for α = .05
34.1 for α = .01

Variance For Center Points = $(.4518)^2$ = .2041

** Highly Significant
*** Very Highly Significant

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TABLE XVI. FACTORIAL ANALYSIS OF 3 INHERENT AVAILABILITY (FLIGHT HOURS/FLIGHT HOURS + UNSCHEDULED & SCHEDULED DOWN HOURS, WITH NORS, FAILURE RATE, AND UTILIZATION AS FACTORS

x_1 Low NORS (-)	x_2 Low Fail.Rate (-)	x_3 Low Util. (-)	Yates Algorithm			Effects Isolated	Average Effect	Value of Each Effect	Effect Nomenclature		Mean Square
-	-	-	8.35	15.10	27.98	50.39	50.39	7.05	Average Response		-
+	-	-	6.72	12.88	25.41	-7.05	-7.05	-1.74	x_1 (NORS) Effect	***	6.21
-	+	-	7.37	15.78	-3.52	-5.37	-5.37	-1.34	x_2 (F.R.) Effect	**	3.60
+	+	-	5.51	12.03	-3.53	.47	.47	.12	x_1 x_2 Interaction		.03
-	-	+	3.24	-1.66	-2.22	-.3	.43	.11	x_3 (Util.) Effect		.02
+	-	+	6.54	-1.86	-3.15	-.01	-.01	.00	x_1 x_3 Interaction		.00
-	+	+	7.03	-2.10	-.20	-.93	-.93	-.23	x_2 x_3 Interaction		.11
+	+	+	5.60	-1.43	.67	.37	.37	-.22	x_1 x_2 x_3 Interaction		.09

| Reported Center Points | | | 0.17 | 0.59 | 6.03 | 6.03 | Mean = 6.6075, St. Dev. = .3999 (3 Degrees of Freedom) | | | | |

Critical Values For $F_{1,3}$
5.54 for α = .10
10.1 for α = .05
34.1 for α = .01

Variance For Center Points = $(.3999)^2$ = .1599

** Highly Significant
*** Very Highly Significant

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TABLE XVII. FACTORIAL ANALYSIS OF DIRECT MAINTENANCE MAN HOURS FLIGHT HOUR WITH NORS, FAILURE RATE, AND UTILIZATION AS FACTORS

x_1 Low NORS (-)	x_2 Low Fail.Rate (-)	x_3 Low Util. (-)	Yates Algorithm			Effects Isolated	Average Effect	Value of Each Effect	Effect Nomenclature		Mean Square
-	-	-	7.57	15.67	31.47	60.05	$\frac{60.05}{8}$	7.5?	Average Response		
+	-	-	7.80	15.30	29.18	.01	$\frac{.01}{4}$	.00	x_1 (NORS) Effect		.0?
-	+	-	7.91	14.10	-.09	1.11	$\frac{1.11}{4}$	.28	x_2 (F.R.) Effect	*	.1?
+	+	-	7.89	15.03	.10	-.39	$\frac{-.39}{4}$	-.0?	$x_1 x_2$ Interaction		.0?
-	-	+	6.94	-.07	.13	-2.49	$\frac{-2.49}{4}$	-.57	x_3 (Util.) Effect	***	.6?
+	-	+	7.1?	-.02	.98	.19	$\frac{.19}{4}$	.05	$x_1 x_3$ Interaction		.0?
-	+	+	7.60	.??	.05	.65	$\frac{.65}{4}$	.21	$x_2 x_3$ Interaction		.??
+	+	+	7.48	-.12	-.34	-.39	$\frac{-.39}{4}$	-.10	$x_1 x_2 x_3$ Interaction		.??

Reported Center Points			7.63	7.95	7.77	7.65	Mean = 7.7650,	St. Dev. = .13300	3 Degrees of Freedom

Critical Values For $F_{1,3}$
5.54 for α = .10
10.1 for α = .05
34.1 for α = .01

Variance For Center Points = $(.13300)^2$ = .01769

* Significant
*** Very Highly Significant

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TABLE XI(?). FACTORIAL ANALYSIS OF MISSION ACCOMPLISHMENT (MISSIONS COMPLETED/MISSIONS TALLIED) WITH NORS, FAILURE RATE, AND UTILIZATION AS FACTORS

x_1 Low NORS (-)	x_2 Low Fail.Rate (-)	x_3 Low Util. (-)	Yates Algorithm			Effects Isolated	Average Effect	Value of Each Effect	Effect Nomenclature	Mean Square
-	-	-	97.33	193.06	386.37	771.88	$\frac{771.88}{8}$	96.49	Average Response	-
+	-	-	95.75	193.29	385.51	- 1.50	$-\frac{1.50}{4}$	- .38	x_1 (NORS) Effect	.
-	+	-	95.93	193.74	- .15	- 1.76	$-\frac{1.76}{4}$	- .44	x_2 (F.R.) Effect	.
+	+	-	97.36	191.77	- 1.35	2.18	$\frac{2.18}{4}$	.55	$x_1\ x_2$ Interaction	.
-	-	+	97.06	- 1.58	.21	- .86	$-\frac{.86}{4}$	- .22	x_3 (Util.) Effect	.
+	-	+	96.74	1.43	- 1.97	- 1.20	$-\frac{1.20}{4}$	- .30	$x_1\ x_3$ Interaction	.
-	+	+	96.43	- .26	3.01	- 2.18	$-\frac{2.18}{4}$	- .55	$x_2\ x_3$ Interaction	.
+	+	+	95.34	- 1.09	- .83	- 3.84	$-\frac{3.84}{4}$	- .96	$x_1\ x_2\ x_3$ Interaction *	.
Reported Center Points			96.09	96.77	97.01	96.17	Mean = 96.5100, St. Dev. = .4508			Degrees of Freedom

Critical Values For $F_{1,3}$:
5.54 for α = .10
10.1 for α = .05
34.1 for α = .01

Variance For Center Points = $(.4508)^2$ = .2030

* Significant

TABLE XIX. FACTORIAL ANALYSIS OF WORK HOURS WITH WORK CONTENT

WORK TIME, FAILURE RATE, AND UTILIZATION AS FACTOR

x_1 Low WORK (-)	x_2 Low Fail.Rate (-)	x_3 Low Util. (-)		Yates Algorithm		Effects Isolated	Average Effect	Value of each Effect	Effect Normal Failure		Mean Failure
-	-	-	17158	43175	97054	210169	$\frac{210169}{8}$	26271	Average Response		—
+	-	-	26017	54779	112215	39551	$\frac{39551}{4}$	9888	x_1 (WORK) Effect	***	139,553
-	+	-	20613	49174	22412	25471	$\frac{25471}{4}$	6368	x_2 (F.R.) Effect	**	
+	+	-	34166	63041	17139	2761	$\frac{2761}{4}$	690	$x_1 x_2$ Interaction		
-	-	+	19819	8859	11604	14261	$\frac{14261}{4}$	3565	x_3 (Util.) Effect		
+	-	+	29355	13553	13867	-5273	$\frac{-5273}{4}$	-1318	$x_1 x_3$ Interaction		
-	+	+	27719	9536	4694	2263	$\frac{2263}{4}$	566	$x_2 x_3$ Interaction		
+	+	+	35322	7003	-1933	-6627	$\frac{-6627}{4}$	-1657	$x_1 x_2 x_3$ Interaction		

Reported Center Points	29771.8	27571.2	30641.9	28698.8	Mean = 29671.675	St. Dev. = 2174.960	(3 Degrees of Freedom)

Critical Values for x_1, x_3

5.84 for α = .10
10.1 for α = .05
34.1 for α = .01

Variance For Center Points = $(2174.960)^2$ = 4,730,451

** Highly Significant
*** Very Highly Significant

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LIST OF SYMBOLS AND ABBREVIATIONS

α	level of significance
θ	mean of distribution
σ	standard deviation of distribution
A/C	aircraft
act.	action
admin.	administrative
AFCS	automatic flight control system
APP	auxiliary power plant
avail.	availability
coll.	collective
cont.	control
corr.	corrective
cum.	cumulative
discrep.	discrepancy
EAPS	engine air particle separator
EMT	elapsed maintenance time
eng.	engine
flt.	flight
F.R.	failure rate
GSE	ground support equipment
HS	highly significant
hyd.	hydraulic
IGB	intermediate gearbox
Insp.	inspection
land	landing

lat.	lateral
L.H.	left hand
Lt.	left
M.A.	maintenance action
Math.	mathematical
Mech.	mechanism
M.G.B.	main gearbox
M.L.G.	main landing gear
MMH	maintenance man-hours
MMH/FH	maintenance man-hours per flight hour
MOS	military occupational speciality
MR	main rotor
MRH	main rotor head
MTBF	mean time between failures
MTBMA	mean time between maintenance actions
MTBR	mean time between removals
MTTR	mean time to repair
No.	number
NORM	not operationally ready - maintenance
NORS	not operationally ready - spares
ORME	operations reliability/maintainability engineering program
PMD	preventive maintenance - daily inspection
PMI	preventive maintenance - intermediate inspection
PMP	preventive maintenance - periodic inspection
Press.	pressure

Prevent.	preventive
Prim	primary
Prob.	probability
Pwr.	power
R&M	reliability and maintainability
Req.	required
Rec.-Trans	receiver - transmitter
R.H.	right hand
Rt.	right
R&R	remove and replace
S	significant
Sta.	station
Stabil.	stabilizer
St. Dev.	standard deviation
Tach.	tachometer
TBO	time between overhauls (scheduled)
Tech.	technician
TOE	table of organization and equipment
T.R.	tail rotor
Trans.	transmission
Util.	utility
VHS	very highly significant
W.C.	work center

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